International Management Digest®

O.S.

JANUARY 1960
ONE DOLLAR

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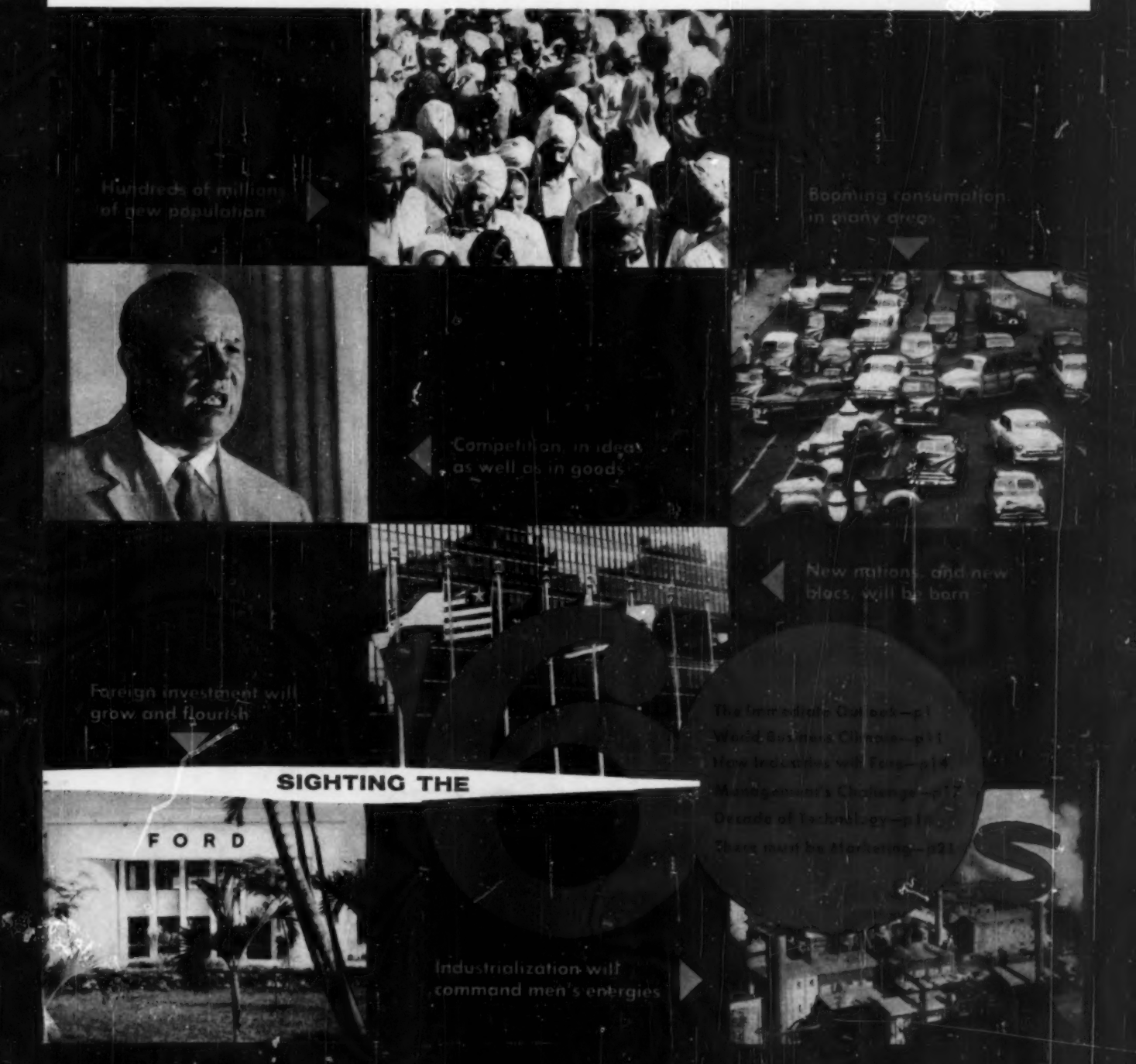
Hundreds of millions of new population
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FORD
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INTERNATIONAL
MANAGEMENT'S

American Letter

Dear Sir:

January, 1960

AMERICAN BUSINESS WILL SET NEW RECORDS IN OUTPUT, SALES, PROFITS: Practically all segments of the U.S. economy will push toward new peaks in 1960. Business activity will rise steadily, and gross national product is certain to exceed $510,000-million by year-end--up 6% from the 1959 record. Overall, there will be a sharp rise in output of durable goods as the year begins (provided there is no second steel strike); inventories will climb; consumer buying will continue its present fast pace in 1960, personal spending is expected to rise $17,000-million to $328,000-million. But you can expect that the rate of economic expansion will probably settle down to a more moderate pace in the second half of the year.

Corporate earnings may well put on a strong performance. Some observers predict a rise of at least 10%; others suggest that a 25% rise, to an all-time high of $29,000-million after taxes, is possible. About 50% of these profits are likely to be distributed as dividends.

Much of the rest will go into modernization and re-equipment. McGraw-Hill estimates that business spending for plant and equipment will rise 10% to $37,300-million in 1960. Sales will rise in many hard-goods lines--including machinery, aircraft, power, rail equipment with gains of 15% or more. Auto sales--including imports--could reach a record 7-million units. Steel output will average 82% of capacity, about 125-million tons compared to last year's 92.5-million.

Note these problem areas: Housing starts and construction generally may be off the 1959 pace; unemployment will continue a nagging problem in some areas. And credit will remain tight--though high interest rates will come in for a good deal of powerful political criticism. 1960 is, after all, an election year.

* * * *

U.S. EXPORTS WILL RISE SHARPLY; IMPORTS WILL GAIN MORE SLOWLY: American commercial exports this year should rise by 10%, to about $18,500-million. While imports--especially of manufactures--will continue their steady year-to-year climb, the pace may be a good deal slower than that of 1959 (some observers forecast only a 3% import rise for the year). The U.S. balance on merchandise trade will become more favorable--perhaps $2,500-million compared to last year's low ebb of $1,200-million. Thus the U.S.A.'s overall balance of payments deficit may be eased slightly in 1960--but not enough to cause Washington to stop worrying.

Here are some of the circumstances behind the outlook for higher exports: (1) A higher export payment rate will bolster U.S. cotton sales; (2) Europe's 1959 drought will increase demand for U.S. corn, soybeans, feedgrain exports; (3) The fast-developing jet transport market will stimulate nearly $1,000-million in U.S. aircraft deliveries overseas; (4) With ample steel supplies expected, many other finished manufactures will be available in quantity for export; (5) Reduction and removal of dollar import restrictions abroad will help U.S. sales.

Perhaps the most important factor: Both the government and the American business community are promoting export business as never before; more and more companies are preparing an aggressive attack on foreign markets.

American Letter

WHAT IS AHEAD FOR WORLD BUSINESS IN 1960? Here is the annual survey by INTERNATIONAL MANAGEMENT correspondents in important world capitals on the outlook for this year:

ARGENTINA: Second stage of Argentina's self-imposed austerity program will mark 1960. Main problem will be to reduce an estimated budget deficit of $330-million. Foreign trade will be balanced as gold and exchange reserves increase in line with stepped-up meat exports and $200-million in additional credits from U.S. and Europe. Peso should maintain its recent stability. Tight money will restrict consumer goods consumption. Oil production will jump 60%, but rising demand will cut exchange savings.

AUSTRALIA: Export outlook is good and earnings should rise about 12%. Wool prices will remain around current levels. A further campaign to increase exports of manufactured goods is planned. Relaxation of import restrictions has worked surprisingly well and strong pressure is being exercised to abolish all import controls. Imports from Europe will be up and American exporters may show a 20% gain in sales due to lifting of controls.

AUSTRIA: Gross national product will expand another 5% in 1960. All industrial sectors are booming, with construction and tourist industries leading the way. Export sales are improving at a rate of 8% a year. Electrical energy buildup enables Austria to export 13% of output. Bilateral exchange with Russia will expand in 1960 but Austria desires to switch over to regular trade channels. Commercial relations with "Outer Seven" countries will be stepped up.

BELGIUM: Economy will experience slow recovery, but coal glut will hamper overall production and employment. Exports will improve as government concentrates on finding new world markets. Textile and steel industry will continue strengthening but more aggressive U.S. sales in Europe (a result of import liberalization) will hamper textile lines, and end of steel strike in the U.S.A. will cut into Belgium's 1959 market there.

BELGIAN CONGO: Political upheavals during 1959 did not impede the Congo's rapidly expanding market potential. Second ten-year development plan begins in 1960, which means another $1,500-million will be available for transport, power and other projects. Bankers in U.S. contemplate a $100-million loan for hydroelectric development.

BOLIVIA: Outlook remains gloomy as U.S. and European exporters tighten terms and restrict sales. One of the world's worst cases of inflation plagues nation. With country near bankruptcy and dollar loans scarce, Bolivia may turn to Russia in 1960. A $60-million emergency credit from Moscow to Bolivia's ailing oil industry is imminent.

BRAZIL: Another trade gap of roughly $300-million faces Brazil. Rio will turn to Russia for more aid and trade in 1960. After three years of discussions Brazil is certain to begin extensive barter deals of coffee, cocoa and vegetable oils for Soviet heavy machinery and oil-drilling equipment. A large credit from Moscow also is expected. Exports will recover from their 1956-58 dip but imports will slide further. Credit position will weaken (the cruzeiro may hit 250) due to heavy currency issues.

CANADA: Business will be good most of year, though the pace of recovery will taper off in later months. Settlement of U.S. steel strike will place strenuous demand on Canada's primary industries. Dollar premium should narrow as so-called "hot money" is repatriated due to climbing interest rates in U.S. and Europe. Trade deficit will improve.

CHILE: Government is performing an excellent job handling finances and rebuilding the nation's economic foundation. In 1959 Chile had a favorable trade balance and attained a "good" credit rating for the first time in years. Businessmen both in Chile and U.S. have great confidence in Alessandri administration. Austerity will be maintained.

COLOMBIA: Optimism prevails. Collections are paid promptly and all outstanding debts on 1957 "bail-out" loan have been paid. Another export surplus is likely this year as Colombia learns the hard way to live within its means. Thus any import increase will be kept at a minimum. More credit from U.S. is likely.

COSTA RICA: Coffee output is at peak but Latin American coffee quotas impede exports. Exchange earnings also will suffer from one of smallest banana crops in years. Costa Rica hopes to become distributing center for Central American trade area. New foreign investment law is one of most liberal in world.

CUBA: Uneasiness exists over further nationalization of industry and banking facilities; overseas suppliers will have to tighten terms unless they can afford longer delays in payment. Imports--and probably exports--will decline steadily until economic stability returns. Sugar crop will be good in 1960.

DENMARK: Activity is highest since end of World War II. Industrial production--up 8% last year--will continue to climb steadily during 1960. Unemployment is one of the lowest in the world. Membership in "Outer Seven" is bound to bolster the already accelerated output and sales in the building materials, metals, food-processing and chemical industries.

ECUADOR: Recovery has been slow but optimism is much more noticeable than a year ago. Domestic business remains dull but banana, cacao and timber exports have been expanding. A marked shift in trade from U.S. to Japan and Europe is occurring.

FEDERATION OF RHODESIA AND NYASALAND: Revival of copper prices and exports coupled with growing tobacco shipments were responsible for largest trade surplus in history ($112-million) in 1959. Mineral output will recover from 1957-58 letdown.

FRANCE: After a year of reform and belt-tightening, France will resume expansion in 1960. Production already is gaining momentum, and may rise 5%. Abnormal steel and auto exports last year pushed up overseas shipments by 9% while imports fell 7% as result of import austerity. But in 1960 imported goods, particularly raw materials, will jump 8% due to sweeping relaxation of quotas and other curbs on dollar and Common Market goods. Exports will be up 5%.

GERMANY (WEST): New records will be set in 1960 for overseas sales and purchases, capital investment, and gross national product (sure to increase another 5%). Exports will reach $10,000-million and imports $9,500-million. Order books are bulging in automotive, chemical, electrical equipment, and consumer goods industries. Textiles have picked up and even the hard-hit coal mines should show some improvement. Leading problem is the acute manpower shortage. Prices and wages will trend up.

GHANA: The $1,000-million second development plan now beginning will open up new markets for European exporters. Heart of the program will be the Volta River project.

GUATEMALA: Industry will show some improvement but low prices and limitations on exports of coffee resulting from Latin American Agreement will handicap entire economy.

INDIA: Import policy for first part of year will not be changed but some relaxation is expected by mid-year. Raw materials and machinery for heavy industries will be required in quantity. U.S. and Russia will intensify "competition" to assist India. Private trade associations plan campaign to promote jute and manganese sales abroad.

IRAQ: Political instability will continue to affect economic structure. Despite rise in oil production demanded by government, petroleum revenues will not meet budget deficit. But authorities will gradually ease controls on imports from the West.

ITALY: An important aspect in 1960 outlook will be increasing capital exports. Italian investments will be larger in Argentina, Mexico, and other Latin Republics. Balance of payments will be in black, with imports and exports rising. Italy will liberalize imports further as currency remains strong and industrial production climbs sharply.

JAPAN: Optimism characterizes business for 1960. But much will depend on the U.S. market for Japanese goods. Steady growth is expected, with expansion of consumers market taking the place of the 1959 investment boom. Personal expenditures will increase 7% in 1960. Overall exports and imports each will be up 10%. Production will jump 14%, with important rises in steel and auto industries.

LEBANON: Public confidence is growing. Gold and exchange reserves are climbing steadily; U.S. and European exporters are relaxing terms on sales to Lebanon. Income tax will be abolished in order to encourage foreign capital. Imports will be up moderately although trading pattern may shift slightly to Soviet bloc, which will buy large quantities of fruits.

MEXICO: A stable economy is likely in 1960, with a firm peso the base for new ambitious industrial expansion. Plans to make Mexico one of the largest automobile producers in Latin America will move ahead; petrochemicals and steel industries also will expand. Trade deficit will be cut further in 1960 as earnings from coffee, cotton, and metals improve. Imports from Europe will be up sharply, and U.S. shippers will have to sell harder in face of growing competition. Chances are Mexico will turn down a $100-million credit offer from Moscow.

NETHERLANDS: Checking the rate of economic expansion is principal worry. There are large backlogs in order books, investment and consumption due to escalator wage increases. Government will impose a dearer money policy to contain inflation. Credit will be tight, and guilder will continue strong. Many new industries will sprout up. Imports and exports will rise again. Look for more industrial mergers with EEC countries.

NEW ZEALAND: Forecast is for considerable improvement in trade and industry. A further buildup of exchange reserves is apparent and import restrictions will be relaxed.

PAKISTAN: Second Five-Year Plan will be slow getting started. Emphasis will be on sugar, textile, and metals production. Foreign exchange reserves are up but still are far from healthy. West Germany's Afro-Asian trade drive will concentrate on Pakistan.

PANAMA: Nationalist unrest will handicap business somewhat in 1960. Last year Panama increased its imports by 30% but will be forced to go slower now as retail sales meet some resistance. Colon Free Zone and Canal traffic will continue to set records.

PERU: Financial and economic stability are rising. Confidence in sol is returning and currency will strengthen further. Sugar and cotton exports are up and outlook for 1960 is still more promising. U.S. may increase Peruvian sugar quotas; cotton prices will be higher. Domestic industry is expanding.

PHILIPPINES: Trade will be diverted more away from Europe and U.S. to Southeast Asian nations. Strong prices are expected for copra, hemp and metals. At home, business will improve.

(The 1960 outlook will be concluded next month)

The Editors

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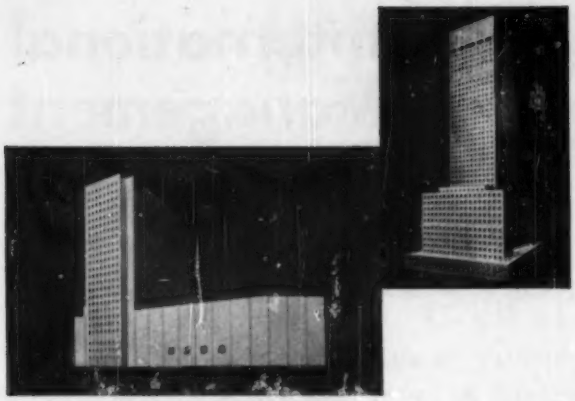

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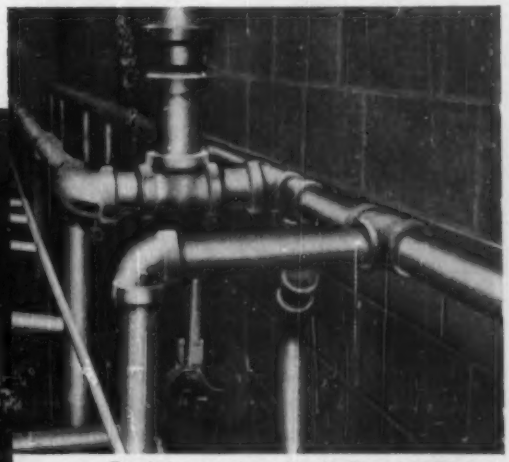
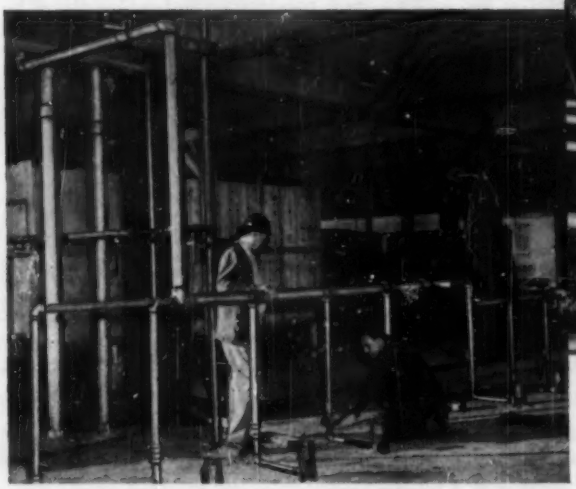


For drainage and vent lines in New York Coliseum



For vent lines in Socony Mobil Building in New York City

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JANUARY 1960

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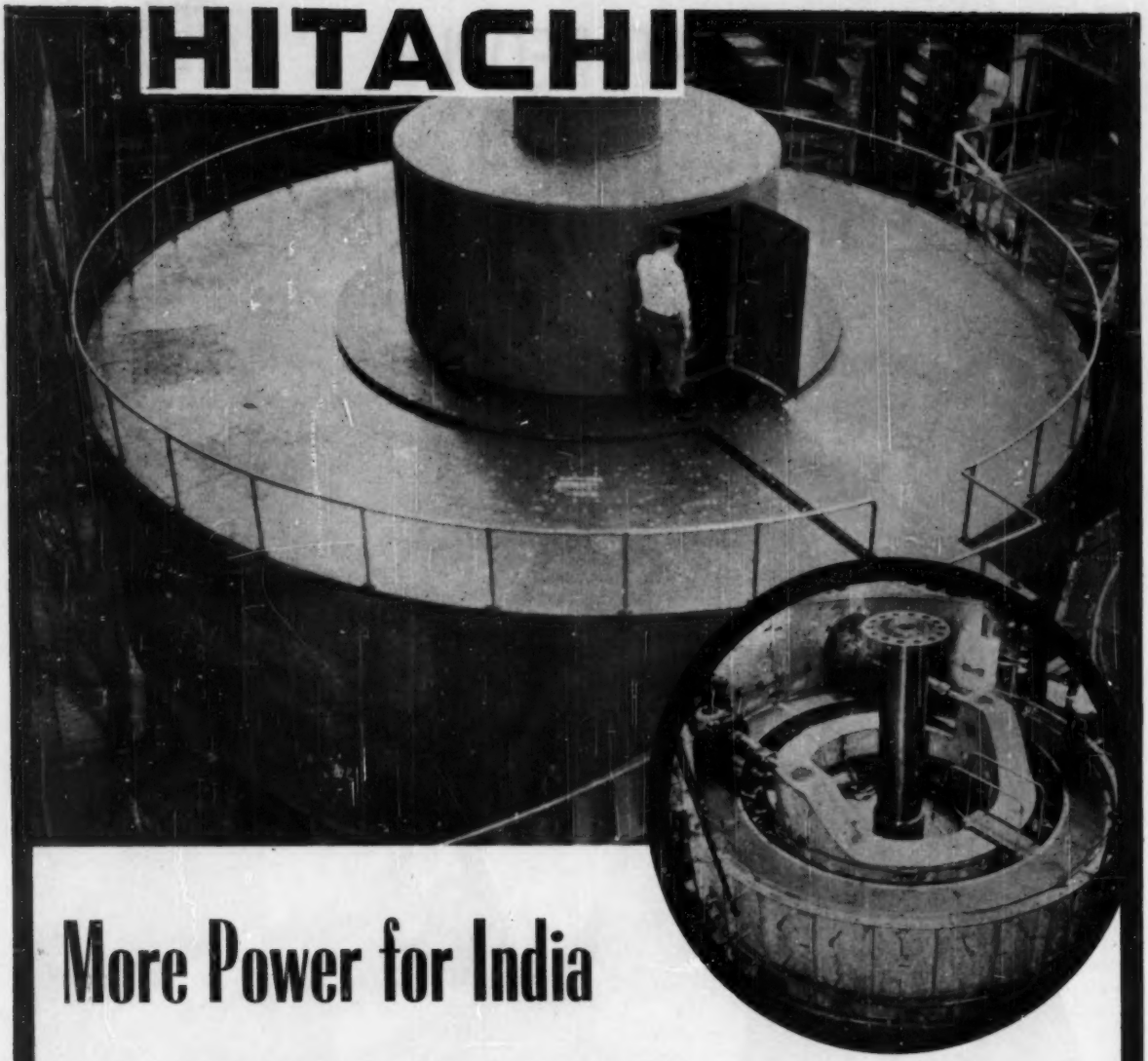

More Power for India

Two 32,500 kVA A.C. Generators were recently completed at Hitachi, Ltd. for the Ganguwal and Kotla Power Stations, downstream of India's huge Bhakra Dam.

These umbrella type units are specified at 11,000V, 166.7 rpm and 50 c/s and will each be coupled to Hitachi 40,000 HP fixed-blade propeller turbines. They are to be operated in parallel with generators previously supplied by another internationally-known manufacturer but, by comparison, are lower and present a more compact appearance.

Some of the more notable features offered by these Hitachi generators are (1) the exciter is equipped with an air duct and cooled in common with the generator by the one refrigerating system, (2) the generator is of the enclosed air-duct circulation type and, if the air cooler should be temporarily out of commission, a window on the air duct permits continued operation at 90% output.

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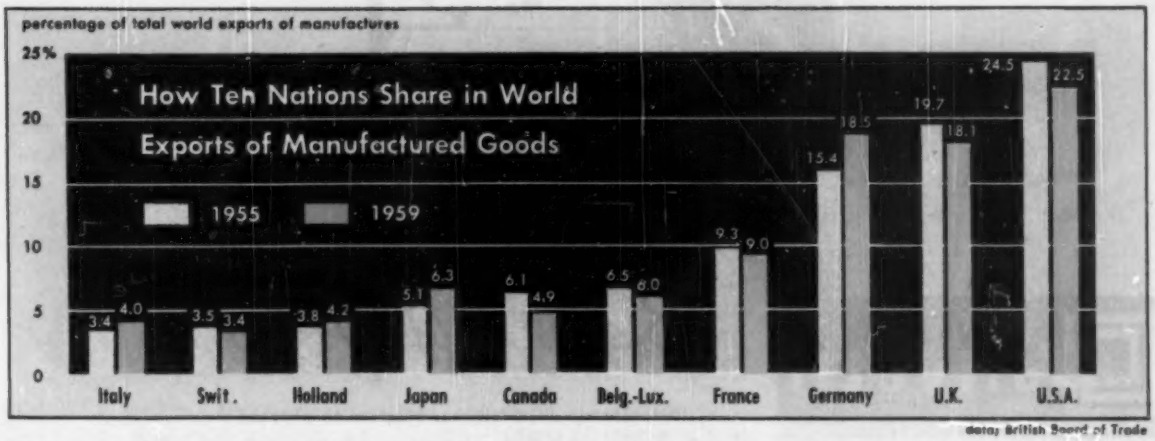
INTERNATIONAL MANAGEMENT'S

Business at a Glance



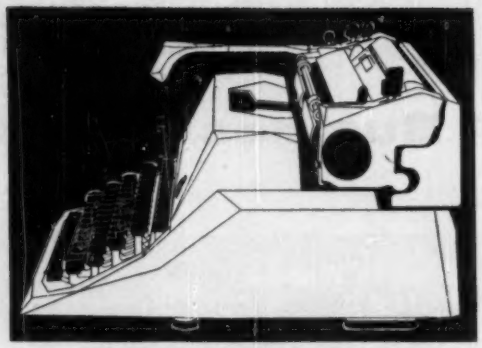
data: British Board of Trade

TRADE IN FINISHED GOODS, accounting for a little less than half world commerce, is expanding again. According to a breakdown of first-half 1959, exports of manufactures rose 4% over the same period in 1958, 20% above 1955. But not all nations share equally in the growth: The chart shows how Japan, Germany, the Netherlands, and Italy have gained over the past four years at the expense of the U.K., the U.S.A., Belgium-Luxembourg, Canada, and France. Note that while France's share is down vis-a-vis 1955, there has been a dynamic increase in the past year, and France appears well on its way to increase its share of world markets.

A QUICK REVIEW OF EXCHANGE, CREDIT, AND BUSINESS CONDITIONS

Country	Exchange Rate (units per $1, New York)			Government Reserves (gold & foreign exchange, millions)		Dollars in U.S. Banks	Conversion Delays / Collection Experience		Business Conditions
	2 Dec. 1959		6 Nov. 1959	latest month	year ago	(Millions)			
Argentina	82.00	Peso	82.00	$ 212.1	$ 177.0	$ 268.0	3 Mos.	Fair-Good	Fair
Australia	* 2.23	Pound	* 2.23	1,157.0	1,120.0	109.0	None	Very Good	Good
Austria	25.65	Schilling	25.65	740.0	661.0	394.0	None	Good	Good
Belgium	50.25	Franc	50.25	1,368.0	1,428.0	129.0	None	Very Good	Improving
Bolivia	12,000.00	Boliviano	12,000.00	2.4	2.4	19.5	4 Mos.	Poor-Fair	Poor
Brazil	195.00	Cruzeiro	182.00	486.0	498.0	169.0	3 Mos.	Good	Fair
Canada	.9524	Dollar	.9456	1,883.0	1,910.0	2,245.0	None	Very Good	Good
Chile	1,100.00	Peso	1,100.00	126.7	65.3	171.2	2 Mos.	Good	Improving
Colombia	6.90	Peso	6.78	334.0	145.8	194.0	2 Mos.	Good	Improving
Costa Rica	6.67	Colon	6.67	19.4	21.0	24.5	1 Mo.	Good	Fair
Cuba	1.25	Peso	1.25	313.0	429.0	202.0	3 Mos.	Poor-Fair	Deteriorating
Denmark	6.80	Krone	6.80	284.5	224.3	112.9	None	Good	Good
Dom. Rep.	1.00	Peso	1.00	40.7	43.2	35.0	1 Mo.	Fair-Good	Deteriorating
Ecuador	16.67	Sucre	16.67	38.4	35.3	17.4	1 Mo.	Fair-Good	Improving
El Salvador	2.50	Colon	2.50	34.6	38.1	25.0	1 Mo.	Fair-Good	Improving
Finland	351.00	Markka	351.00	304.0	269.4	70.6	None	Good	Improving
France	492.50	Franc	492.50	1,911.0	1,090.0	1,157.0	None	Good	Good
Germany	4.1750	D-Mark	4.1750	5,393.0	6,096.0	1,413.0	None	Very Good	Good
Greece	29.41	Drachma	29.41	198.0	198.0	160.9	1 Mo.	Fair-Good	Improving
Guatemala	1.01	Quetzal	1.01	43.9	45.1	34.7	1 Mo.	Good	Deteriorating
Honduras	2.00	Lempira	2.00	15.8	7.4	6.3	1 Mo.	Good	Fair
India	6.25	Rupee	6.25	663.0	649.0	119.0	1 Mo.	Good	Fair
Indonesia	200.00	Rupiah	200.00	249.0	214.0	108.0	3 Mos.	#L/C Basis	Deteriorating
Iran	76.92	Rial	76.92	228.0	282.0	27.0	3 Mos.	Fair-Good	Fair
Iraq	* 2.70	Dinar	* 2.70	319.0	337.0	18.0	2 Mos.	#L/C Basis	Deteriorating
Israel	2.50	Pound	2.50	124.6	104.1	78.3	1 Mo.	#L/C Basis	Improving
Italy	621.00	Lira	621.00	2,978.0	2,364.0	1,578.0	None	Good	Good
Japan	392.00	Yen	400.00	892.0	939.0	1,140.0	1 Mo.	Good	Good
Mexico	12.35	Peso	12.35	413.0	402.0	400.0	None	Good	Good
Netherlands	3.77	Guilder	3.77	1,353.0	1,516.0	435.0	None	Good	Good
New Zealand	* 2.63	Pound	* 2.63	266.0	182.0	7.0	None	Very Good	Improving
Nicaragua	8.00	Cordoba	8.00	10.9	9.90	11.3	None	Very Good	Fair-Good
Norway	7.14	Krone	7.14	234.7	225.9	103.1	None	Good	Improving
Pakistan	6.67	Rupee	6.67	188.0	157.0	6.0	2 Mos.	Fair-Good	Improving
Panama	1.00	Balboa	1.00	45.7	42.4	153.0	None	Very Good	Fair
Peru	27.40	Sol	27.40	55.4	25.8	87.8	2 Mos.	Good	Improving
Philippines	3.57	Peso	3.57	78.0	73.0	180.0	1 Mo.	#Fair	Poor-Fair
Portugal	28.17	Escudo	28.17	797.0	732.0	151.0	1 Mo.	Good	Fair
South Africa	* 2.76	Pound	* 2.76	388.0	311.0	43.0	None	Very Good	Good
Spain	60.40	Peseta	60.60	54.0	57.0	67.0	None	#L/C Basis	Improving
Sweden	5.17	Krona	5.17	139.0	476.0	330.0	None	Good	Good
Switzerland	4.34	Franc	4.34	1,944.0	2,098.0	905.0	None	Very Good	Good
Turkey	12.50	Pound	12.50	274.0	310.0	32.0	12 Mos.	#Poor	Poor-Fair
U. A. R.	* 2.00	Pound	* 2.00	386.0	400.0	16.0	3 Mos.	#L/C Basis	Poor-Fair
U. K.	* 2.7980	Pound	* 2.8050	2,987.6	3,069.0	1,056.0	None	Very Good	Good
Uruguay	11.11	Peso	10.53	180.0	180.0	73.0	None	#Fair	Improving
Venezuela	3.34	Bolivar	3.34	948.0	1,151.0	278.0	1 Mo.	Good	Fair

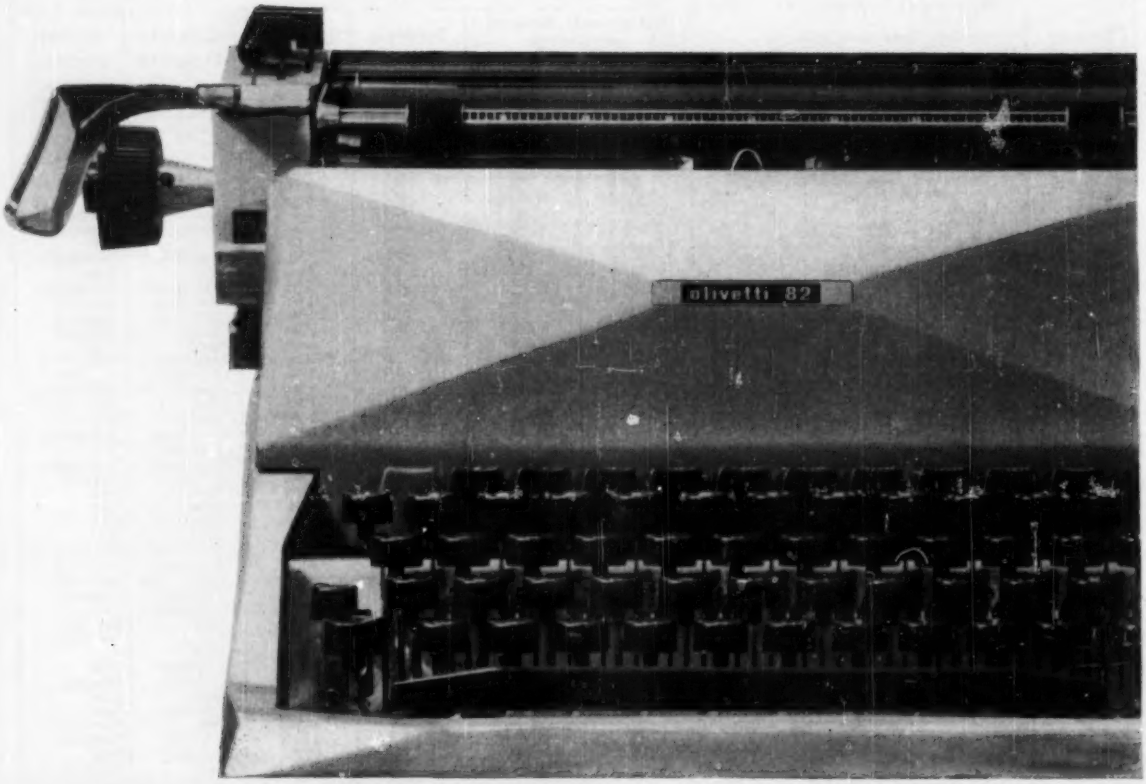
*U.S. Dollars per Pound #Most Exports by Letter of Credit



olivetti

Olivetti 82 Diaspron

**In the series of machines, different in purpose the same in quality,
from portable to electric,
that Olivetti produces for mechanical writing,
a new typewriter, with integrated carriage,
takes its place.
To office work, daily and continuous,
the Olivetti 82 Diaspron contributes
with the clear precision of its characters,
the solidity and durability of its construction,
numerous uses, swift writing and
the simple elegance of its form.**



Ing. C. Olivetti & C., S. p. A., Ivrea (Italy)

SIGHTING THE '60s

The business climate will be determined, as never before, by peoples' soaring hopes for higher living standards.

That means growth—and severe growth pains. But the outlook is hopeful if rich and poor nations learn to cooperate.

New Force in World Business

FOR TWO DECADES the world has been preoccupied with conflicts and changed relations between its "East" and its "West." In the decade ahead, the lines of stress—and avenues of opportunity — will stretch between North and South.

World business in the 1960s will be critically influenced by relations between the rich, highly-industrialized nations, most of them in northern latitudes, and the poor, bighly-ambitious peoples of Latin America, Asia, Africa. Ambitions soar with numbers: In the next ten years, population of these "under-developed" lands will increase by nearly 25%. Some 300-million new people will add their voices to the clamor for higher living standards, political rights, and national prestige.

The North/South equation will interact with other powerful influences on the business climate. Note the surging development of Europe and Japan; the adjustments by the U.S.A. to changed trading conditions; the power of the U.S.-S.R. and China; regional blocs; the flow of capital.

They present a confusing checkerboard of trends. Yet the businessman has to make some assumptions upon which to base his plans. Two seem justified:

—That there will be no major war during the '60s. Major war means suicide, and the world is retreating from that prospect. But "limited" wars may come. And they can be upsetting—as the world found at Korea, at Suez, at Budapest, and at Dienbienphu.

—That there will be no severe, prolonged depression affecting the principal business centers. Governments and international institutions will not permit that to happen if they can help it, and there are grounds for hope that they can. But there will be moderate ups and downs such as occurred in the 1950s —perhaps two or three cycles by 1970.

INTERNATIONAL MANAGEMENT DIGEST took these assumptions to businessmen, government officials, and economists, asked them for their forecast for the 1960s. Almost every-where there was a feeling that the world economy, while it has severe problems, is healthier. The business outlook is hopeful.

I. The North Growing Apace

Time and again, the men with whom INTERNATIONAL MANAGEMENT talked returned to this theme: The pressures on governments to satisfy the ambitions of their people will be a determining factor in business. This applies most directly to the poorer nations. But it also applies in Europe, America, and Japan.

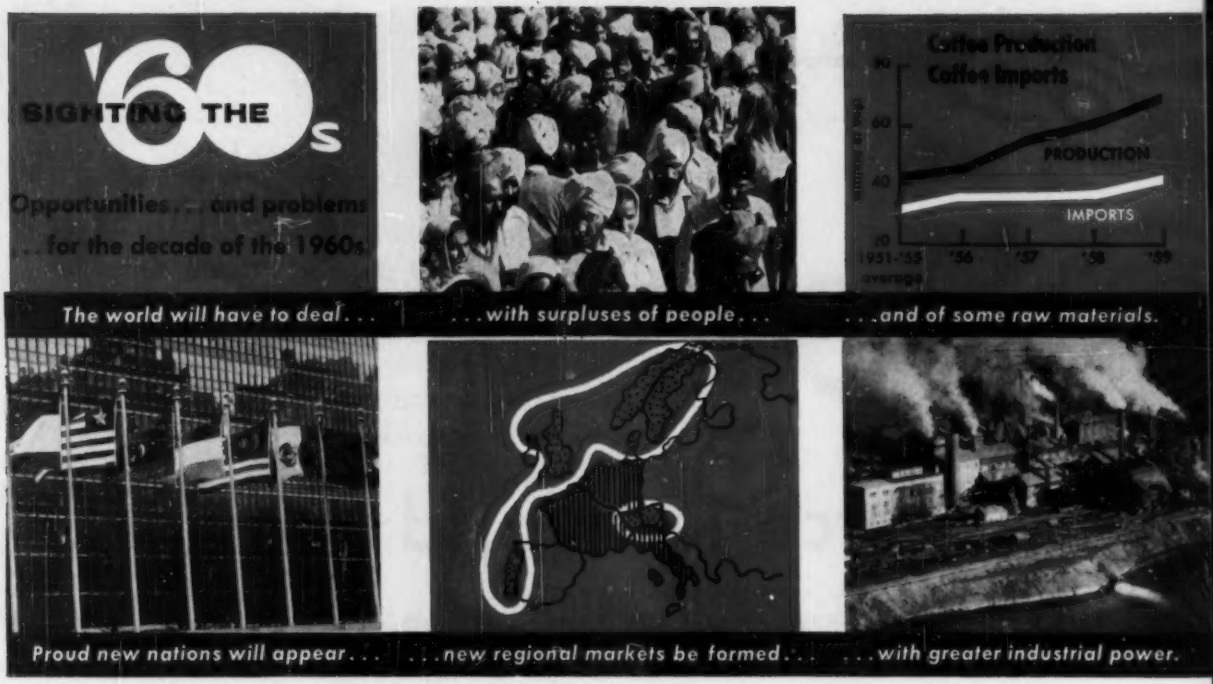
• **Europe**—Western Europe has been hit by the full impact of the "affluent society"; the urge to have cars and home durables and more leisure is spreading irresistibly. What Europeans used to call "American" Capitalism is suddenly revealed as just Capitalism come to maturity.

Europe's consumption boom presents problems as well as opportunities. Europe enters the '60s with a much smaller cushion of extra resources than it had ten years ago, for one thing, there will be slower rise in the labor force. So expansion of output will depend heavily on industry's continued productivity gains through investment in re-research, new plant, and better allocation of resources. Demand will often press against the limits, and costs will tend upwards. Governments will need all their monetary and fiscal skills to contain the pressures.

The big "if" in Europe economic future is whether government and business will be adventurous enough. The same "if" applies elsewhere in the world.

Take Britain. It must stay competitive in world markets. Yet many Englishmen fear their industry is lagging in research and development spending. Also, many Britons insist that more emphasis must be placed on building "social" or public capital. The 1950s brought the consumption boom. This will go on, but now the country needs more roads to put the new cars on, more homes to put the new TV sets in; cities are antiquated and in need of sweeping rebuilding.

• **Blocs**—You can talk with a dozen people and get a dozen different predictions about precisely what will happen to the six-nation Common Market and the Outer Seven Free Trade Area. But there


SIGHTING THE '60s
Opportunities . . . and problems . . . for the decade of the 1960s
Coffee Production
Coffee Imports
PRODUCTION
IMPORTS
1951-'55 average
'56
'57
'58
'59
The world will have to deal . . .
. . . with surpluses of people . . .
. . . and of some raw materials.
Proud new nations will appear . . .
. . . new regional markets be formed . . .
. . . with greater industrial power.

is agreement on one thing: They will find a way to link up by 1970. What seems more important than today's bickering among the politicians is that European businessmen are thinking of Europe more and more as a whole, that they will go on finding ways to leap national and bloc barriers.

And because it is consuming and investing more, Europe will be importing more from overseas, in spite of its blocs. And it will export more. One of the great influences on trade in the '60s will be European growth.

Canada and Japan are even more likely to maintain high growth rates. Fast expansion of the Canadian labor force and industrial base will make for large increases in national product and income. In Japan, very substantial gains in per capita income, and export capacity, are expected. Japan's success in slashing its rate of population increase (to 0.7% yearly) and raising its output (up 48%, 1953 to 1958) is one of the most striking performances of the past decade.

• **Communists** — The European Communist countries will progress in the '60s. But their governments face strains in meeting the demands of the people. The post-Stalin liberalization has stirred popular hopes—especially in the U.S.S.R.

The Russian economy is at a turning point. It must begin to branch out from heavy industry into consumption goods and services. It must deal with a developing labor shortage, and the complexities of great size. In the decade to come, the Soviet growth may come harder.

Communist nations will be a more important factor in world trade. They will be selling more in order to buy, and they may buy a lot as they strive to raise living standards. This trade may not be as disruptive as many people fear. Of course there will be "political" trade and dumping—traps for the unwary. But overall, the effect of Communist trade will be to increase the general level of world trade.

• **The U. S. A.**—For all the worry expressed this year about the U. S. economy, the outlook for the '60s seems surprisingly good. There are these new reasons for optimism: (1) a stronger and steadier wave of business investment in research and equipment; (2) a continuing increase in middle-income families; (3) more skillfull marketing; (4) the government's expanding effort to insure stability and business competition.

Businessmen in the '60s will be grappling with the U.S.A.'s own "population explosion." By 1970, population will grow by 34-million, the equivalent of a new Canada, Cuba, and Australia combined. Like Europe, America is faced with need for heavy investment in schools, roads, hospitals, better cities.

Overseas suppliers should benefit all along the line: The U.S.A.'s import needs are growing year by year, and policies that would materially reduce imports are unlikely (though there will be protectionist moves now and again against specific products).

Many Americans enter the '60s worried about their international economic relationships—about a possible balance of payments crisis, about America being "priced out of world markets." There is no doubt that U. S. industry faces some painful readjustments.

But there is a good deal of doubt that U. S. industry has been rendered permanently non-competitive. And it will not be non-competitive if the U.S.A. can keep its costs in line and if its businessmen adapt to foreign marketing.

There are signs that businessmen are buckling down to sell more competitively abroad. And government is determined to moderate the international deficit. That these efforts might be successful is implicit in the forecast of some observers who see, in the late '60s, the possibility

Consumption will boom, creating . . .
. . . competition among enterprises
. . . and competition among nations.
IFC Exim Bank IMF
IDA
Latin American Bank
Unio
WORLD BANK
Colombo Plan
FORD
MANAGEMENT + MONEY
= GROWTH
Needed: A larger public and . . .
. . . private capital flow abroad . . .
. . . and emphasis on better managers.

of still another dollar shortage.

Says a British economist: "The Yankees are smart, and they have the resources. They will succeed."

• **Rising Trade**—An almost certain result of business expansion in the industrial areas is an increase in world trade. The scope for greater exchange of highly differentiated products is widening, in consumer goods as well as capital equipment.

But this growing trade may not benefit all the world equally. Trade among the principal industrial nations is becoming a steadily higher proportion of total world trade. And that poses the critical problem of the '60s: The rich North keeps getting richer, but the poor South struggles to catch up.

II. Problem of the South

There are breathtaking opportunities in the human and material resources of Latin America, Africa, and Asia. Yet they are too often wasted. To exploit them fully requires, among other things, capital. And most of the less-developed nations have not been able to earn enough to import all the capital they need.

They probably will not be able to in the '60s, either. The terms of trade will probably continue to favor the industrial nations. And note that consumption of industrial raw materials has been expanding more slowly than the growth in output in industrial countries. Substitution of synthetics is one reason, so is the tendency for manufactured goods to require more processing but less raw materials per unit.

• **More Industry**—To escape the squeeze, most under-developed nations press for industrialization. Consider the case of Egypt, cited by a World Bank expert.

He concedes that agricultural improvements are needed, and that the High Dam project at Aswan mirrors that need. But he declares that Egypt's land, even with greatly improved yield, cannot support the people it must support by 1970. Nor can agricultural exports, primarily cotton, earn enough exchange to buy the things those people will need, let alone what they will want. So, says the Bank man, there must be an attempt to establish at least some light industry.

With local and national differences, Egypt's problem is echoed throughout the world.

What impact will the gathering drive for industry have on the world economy? It will mean strains. It will mean, over the short-term, higher exports of capital goods from the industrial lands, provided they can provide the financing. Then, the long-term trend may cause some startling shifts in traditional trade patterns.

• **Competition**—As industrial development proceeds, the poor nations will provide much stiffer competition for industrial countries—and not merely in textiles, but in more complex goods as well. Brazil, Mexico, India are nations that will present that kind of competition in the '60s.

In fact, some trade experts believe that exports of manufactures involving relatively large amounts of low-skilled labor may be the poorer nations' best competitive bet. The big "if" is whether the industrial areas will grant admittance to such products.

If they do, the under-developed lands can use the resulting exchange to buy, along with specialized capital goods, great quantities of foodstuffs which might not be economic for them to grow themselves. This could mean that the U.S.A. would supply a significant part of the world's food and crops, an area where it may have the greatest competitive advantage. (Perhaps the fantastically high-yield Kansas wheatfields could feed the world, and U.S. trade will gradually polarize around huge exports of raw stuff on the one hand,

and highly complex electronic systems on the other.)

The nations of the South may be able to help themselves industrialize with regional trading associations. They will certainly try, and the world can expect to see powerful trading blocs appearing in Latin America, Africa, Asia (IMD—Dec, p11). The danger, of course, is that such blocs could become rigidly protectionist in their effort to encourage industry.

The very fervor of the revolution of rising expectations could lead in even more illiberal directions—toward civil war, uncontrolled inflation, nationalist chaos. The challenge to both North and South is to damp such tendencies before they get out of hand.

III. Forging the Links

Success will depend upon how well the industrial and the fast-industrializing nations forge the links of interdependence.

Capital is one of the links. Right now the richer nations seem in a better position to supply more capital, and have the means to channel it more effectively.

• **New Mechanisms**—The World Bank and International Monetary Fund enter the '60s with larger capitalization and great prestige. New international, regional and national development institutions are appearing. And there are hopeful new mechanisms that will combine both public and private capital in joint lending operations.

A bigger part of the development financing job will be done through international agencies in the '60s. They can raise a great deal of money and channel it more effectively than individual nations.

Private investors will have to get used to the idea of more "mixed" economies, with heavy doses of socialism and nationalism. Many observers believe that the less-developed areas will not accept foreign private investment so readily when it means foreign control of an industry or profit remittances that appear, to the host country, excessive. Joint ventures between foreign and local partners will become more popular.

Yet here is a hopeful countertrend which favors the enlightened foreign investor. More attractive investment laws and tax measures, sounder financial management are appearing in some of the under-developed countries.

• **Raw Materials** — Markets are another link. Industrial nations are coming to realize that keeping up the purchasing power of their trading partners is good business. That means buying more from them, continuing the past decade's progress toward freeing world trade. And it also means helping to stabilize markets for raw-materials.

According to Mexico's Antonio Carrillo-Flores, no stabilization step is "as well founded, as just and simple as that of prior consultation among producers." To this he adds that industrial countries must grant priority to underdeveloped lands in raw-materials trade, reduce taxes and other restrictions.

There may be more effective international efforts—such as a change in the structure of the IMF to allow it to accept stocks of raw materials as collateral on short term loans. There will be many other suggestions: Most will not be adapted, a few will. Fluctuations cannot be eliminated, but they can be made less disastrous for the producer nations.

• **Adjustment to Changes**—With these and other links in place—and given the absence of another major war or bone-chilling depression—both industrial and now-industrializing nations should be able to adjust to the changes that the "revolution of rising expectations" will bring in the coming decade.

Both sides need each other. The poorer South wants to develop and to raise its living standards, and the richer North knows that it can only grow richer by helping the less-developed nations to move steadily forward.

Stresses lie ahead—marketing imbalances, currency problems, aggravated nationalism—but indications are that most nations will adopt to these stresses. The hope and promise of the '60s is that both the "haves" and "have nots" will exercise imagination, caution—and good sense.

Industry by

Ten years from now, the structure of many great world industries will have changed. Some will grow very fast; others will barely keep up with population growth; a few will decline. And within each industry, many familiar corporate faces will have disappeared under the implacable pressure of competition and change.

Below is a brief review of some of the major industries, their problems and opportunities in the 1960s.

POWER

The world's electrical energy requirements will climb at approximately 10% a year during the next ten years. The rate of increase may be even higher in some of the fast-industrializing countries (Mexico, Colombia, Venezuela, India, Australia, several African nations).

Petroleum will overtake coal as a source of electric energy during the next decade, something that happened in the U.S.A. ten years ago. In Europe coal will produce only 37% of total power output by 1970, as against 58% at present. Natural gas also will become more important; note the shipments of liquefied gas by special vessels to Britain (IMD, Dec '59, p 34).

Ample, cheap supply of oil and coal, and high cost of atomic plant, will delay ambitious plans for using nuclear energy. Euratom's original program called for 15,000 megawatts of nuclear generating plant to be commissioned by 1967. Now, no more than 3,000 megawatts are envisaged by that time. Nevertheless, the British remain confident that their nuclear energy program will become competitive with conventional energy costs, and may comprise about 15% or more of their total installed capacity by 1970.

PETROLEUM

Petroleum's over-supply problem will continue into the '60s. The free world's annual growth in demand will only be 5%, as against 8% during the 1946-56 period. The sharpest decline will be outside the U.S.A., where the annual rate of increase will dip to 6½%, compared with 12% a few years ago. In the U.S.A., growth in demand may be more sluggish—3½% yearly, as contrasted with 6% in 1946-56.

Industry: How the Decade Looks

Competition from the other fuels and new sources of production also will contribute to the over-supply problem. French Sahara output will rise from the current 440,000 barrels daily to about one million b/d. by 1965. Thus additional trans-Arabian pipelines or increased Suez Canal capacity may not be necessary.

There is also the likelihood of more Communist-bloc oil in Western markets (now about 211,000 b/d, but expected to jump to 500,000 b/d in the next few years).

Excess refining capacity in the U.S.A., Europe, and Asia also adds to petroleum's problems. It may take another few years to bring refining capacity into balance with demand.

So, more aggressive oil marketing will emerge as the major solution to the over-supply picture. Emphasis will be placed in finding new and expanding uses for oil in industry and home heating. Also you can expect petroleum companies to squeeze waste from operations and to streamline distribution systems.

MOTOR VEHICLES

This year will be the most highly competitive in the history of the industry. The formation of regional markets, rising living standards, and the determination of industrializing nations to build their own vehicles will make it even more competitive in the decade to come.

Note the past ten years' growth: From 1950 to 1959, the world's motor vehicle fleet increased to 112-million units, a rise of 77%. In Europe, the increase has been on the order of 160%. Percentage gains in Africa, Asia, and Latin America have been even greater.

Projections for 1970 suggest that Europe's vehicle population will double, and annual production (now about 5-million units) will equal that of the U.S.A. (at about 9.5-million yearly in 1970). This growth presents tremendous opportunities for business and tremendous problems for state and city planners who have to cope with the flood of vehicles.

In less-industrialized nations, assembly of vehicles will rapidly give way to more or less complete manufacture. In a few cases, the rush to begin auto production will result in painful readjustments.

For vehicle producers, the premium will be on large operations. There will be more mergers and marketing arrangements among producers; the smaller firms that do survive the '60s will be specialists.

Look for a "levelling" of automotive standards as between the North American and European producers. The Americans are beginning to stress more functional and economical autos, and will not be so profligate with annual style changes. The Europeans, on the other hand, may find that they will have to place more emphasis on style changes than they have.

TRANSPORT

When they are not motoring, people will be flying—occasionally at over 1,000 km/hour. Supersonic jet transports may comprise about 15% of the total jet fleet by 1970. But subsonic jets and turboprop planes will remain the most feasible equipment for the short and medium routes in passenger and cargo traffic. For the long, non-stop runs, small airlines (and some larger ones) will be pooling operations to obtain maximum economies.

The railroad age is over, but modernization programs will be continued in the more crowded industrialized countries. "Piggy-back"—carrying of trailers by rail—will expand in Europe and the U.S.A.

Ships powered by nuclear energy should begin to compete economically with conventionally-driven vessels in another ten years. Building of super-tankers and more modern dry cargo ships will be stressed; and some believe that only a world-wide effort to scrap the smaller, less efficient ships can bring recovery to a depressed industry.

CONSTRUCTION

There are exciting growth possibilities—providing financing can be found in housing, industrial building, and highways.

Highway-building is one of the

Ten Years of U. S. Product Growth*

Rapidly Growing Products 7½% yearly or more	transistors	antibiotics	polyethylene
	styrene	helicopters	synthetic rubber
	air ton-miles	synthetic fibers	argon
	air conditioners	tape recorders	shavers
	tractors	electric blankets	helium
	powermowers	jet fuel	rayon tire cord
	urea resins	frozen foods	phonographs
	ice-machines	separate skirts	diesel-elec. locomotives
	home freezers	aircraft	synthetic detergents
	truck transport	aluminum	plywood
Moderately Growing Products 7½% yearly or less	men's sportscoats	auto repairs	electric power
	natural gas	glass containers	steel drums
	refrigerators	lamps	cigarettes
	telephones	cheese	paperboard
	industrial trucks	fine paper	typewriters
	vacuum cleaners	reinforcing bars	bathtubs
	shoes	paint	auto tires
	iron ore	books	copper
	machine tools	sugar	fuel oil
	cinema films	candy sales	explosives
Products Showing a decline	tin consumption	cigars	lumber
	coal	men's suits	brick
	wool carpets	zinc	butter
	wire nails	sheep skins	inner tubes
	natural soap	radiators	locomotives, steam-electric
	silk consumption	lead	ironers
	local transit	clay tile	work shirts

* 1949-1958 record of output (or consumption) of certain goods and services in the U.S.A., 1949-1958. data: U.S. Dept. of Commerce

SIGHTING THE '60s

most pressing tasks of the '60s. The International Road Federation expects that spending on highway construction will exceed $45,000-million by the year 1965, almost twice the 1959 level. In Europe and America, it is a question of coping with floods of new motor vehicles; in Latin America, Africa, and Asia, the urgent necessity is one of opening new areas to economic development—and nothing does that faster than new all-weather roads. Africa will provide one of the most spectacular examples of roadbuilding and Latin America, where annual highway construction will account for about $2,000-million yearly, will not be far behind.

MINING AND METALS

The expected expansion of output in Europe and North America this year will increase the demand for metals, and they should enjoy a rising trend (though with ups and downs) throughout the 1960s. However the problem of excess supply—in copper, lead, zinc, aluminum, uranium, for example—will remain. As a result, the metal-producing nations will press harder for international agreements calling for price stabilization.

Look for a substantial rise in global steel output, spurred by expanding industrialization everywhere. It could jump from 335-million tons in 1959 to 480-million tons in 1965, then to 643-million tons by 1972-75. The fast-industrializing nations will benefit from new steelmaking techniques and it is possible that many smaller nations will boast their own mills in 1970.

Aluminum producers see glowing promise—despite their present over-capacity problems. There are excellent prospects for increasing aluminum use in automotive, housing, packaging, electrical fields. A prime target: Increasing per capita aluminum consumption in less developed areas, where it is today less than one-half a kilo.

MACHINERY

The outlook for manufacturers of machinery and other capital goods is excellent, and some observers estimate that world trade in such products will double by 1970.

The developing nations present good machinery market opportunities—provided more financing can be made available. Also, modernization of industry in Europe, North America, and Japan is now speeding up, and the requirements of new equipment amount to thousands of million dollars yearly.

For example: In the U.S.A., the cost of replacing what is really obsolete by today's production standards would cost $95,000 million, according to a McGraw-Hill survey (IMD—Nov. '58, p9). Or take Argentina: It requires $3,500-million worth of imported equipment and machinery by the middle of the 1960s.

Increased shares in the world machinery market will go to those producers who can make quality equipment at the lowest cost, tailored specifically to the needs of the buyer, and—even more important—carrying the most liberal credit terms.

ELECTRICAL/ELECTRONICS

More and cheaper power, rising living standards, technological progress, a marketing revolution—all these augur well for the electrical and electronics industries. For example: In Europe and Japan, appliance sales are soaring to new records, helped along by increased acceptance of installment credit. In other areas, where foreign exchange stringencies prevent mass importation of appliances, local production is growing rapidly.

More home appliances, as well as expanding industry, step up the demand for electric power, and utility companies are struggling to keep up—and that means rising world sales of power generation, transmission, and distribution equipment.

Of all the world's "glamor" industries, electronics is growing fastest, and finding broad applications in everything from space exploration to the smaller-size metalworking shop which will soon be able to afford an electronically-controlled machine tool. In the electronics industry itself, many companies will have difficulty finding the finance and talent to stay ahead, and competition will cause small or medium-sized firms to merge or disappear.

CHEMICALS AND PLASTICS

The chemical industry is one of the fastest-growing, and fiercely competitive, of all. Western Europe's production will grow at an annual rate of 11% or so for the next two years; Japan is in the midst of a booming expansion in the field of petrochemicals; the U.S. industry is rapidly "internationalizing" itself to become competitive in all markets; and the Russians, intent on building up their lagging chemical industry, seem anxious to import entire plants from the West.

Even in the less-developed areas, there is considerable progress in laying down the foundations of a chemical industry. Latin America, India, Australia, South Africa, the Philippines are places where production is growing. This prospect could place even greater competitive pressure on already low chemical profit margins in the older industrial areas.

TEXTILES

The world textile industry is entering a period of better business. Output is rising in many nations; inefficient mills are either disappearing or modernizing. Rising population and living standards assure a steady, if not spectacular, growth.

The spectacular performance will be provided by synthetic or "noncellulosic" fibers, which promise to continue the growth pattern of the past decade. From 61-million kilograms in 1950, synthetic fiber output has risen to almost 500-million kg. (3% of total world fiber output). New types of synthetics are joining the present fibers, and together they will expand their markets at the expense of wool, cotton, and rayon.

Though it will continue to grow, world textile trade will be hobbled by trade restrictions. The so-called "lower wage" nations of Asia and Africa are constantly adapting the most modern textile technology, increasing their competitive advantage over Europe and North American mills. While the latter are rapidly modernizing and rationalizing their industries, they cannot count on rising textile exports (save for specialties) and will continue to protect domestic mills as much as possible.

Management: Competition = Change

Small companies must broaden management, seek capital, pool resources. For big business, look for tighter central control, a battle for status.

IN THE 1960s, management will be under increasing pressure to streamline the company organization, make better and faster decisions, and to improve productivity and marketing. You will see the aggressive companies—small, medium, and large—merging, diversifying, and taking a larger share of expanding markets.

For many enterprises the problem will be one of survival in an increasingly competitive and complex business world.

No doubt the most severe pressures will be on the smaller company. Traditionally, they have concentrated on serving local markets. Now, as local markets become part of national or regional markets, how will the smaller firm fare?

I. The Small Company

Note this observation from a student of small industry, Dr. Eugene Staley of the U.S.A.'s Stanford Research Institute: "Though modern industrialization does bring large manufacturing units, small units also continue to function; they do not disappear, even in the highly-industrialized economies."

In West Germany, for instance, figures for a recent year show that almost 90% of all manufacturing plants had under 100 employees. And these plants accounted for 27% of all manufacturing employment, 23% of all manufacturing output. In Japan, on the other hand, small industry is not so efficient: 99% of all plants have under 100 employees; these plants account for 59% of all manufacturing employment, but only 37% of output.

For the small companies around the world, the task is to correct weaknesses without losing the flexibility that a small concern must have. Here are some of the more dangerous weaknesses:

• **Organization** — Typically, the small company is a family enterprise, with little management specialization. The owner-manager and a few assistants—often relatives—handle all aspects of the business: production, sales, finance, purchasing, and personnel. There is seldom a "line and staff" organization; and as a practical matter, middle management does not exist.

This situation is not all bad, by any means. There is usually close contact between management and its labor, suppliers, and customers. And if the quality of the top management is good, the result can be a competitive advantage.

But the owner-manager cannot be proficient in all areas of business. He is an excellent engineer, has sales ability or organizing talent, but seldom all three. To alleviate this problem, a professional man is often hired to take over in the area where the owner-manager is weakest. This is an effective way to bolster a small enterprise.

Many small companies are going beyond that, however. They are taking steps to build a middle management organization. This means delegation of authority; it means competing with larger companies for bright young men; it means broadening the horizon of all managers through management associations, training institutes.

Owner-managers are beginning to recognize the critical problem of succession. Family offspring are faced with the choice of becoming professional managers themselves, or yielding operating control to a professional outsider.

II. Financial Control

The typical small enterprise is usually financed by the owner-manager, his family and friends. The company does not have access to an organized security market, and usually has trouble arranging even for short-term credit. The brightest hope here are the special institutions being set up by governments, trade, or financial associations, to offer financing aid to the small firm. Plant and equipment, for example, can be made available to small companies on a time payment basis.

One idea that could catch on in the coming decade is "supervised credit," whereby financial aid is combined with technical aid and management advice. In practice, this is already being done through licensing agreements with larger partners; but it can be done through institutions without dilution of ownership.

To keep up with technology and competition, an increasing number of private concerns will be selling stock to outsiders, becoming public corporations, merging with other firms, and entering into joint ventures with both domestic and foreign concerns.

• **Control Systems** — Beyond the selection of good managers, management control depends on a well-constructed records system. Cost accounting is basic, yet a surprising number of companies cannot pinpoint their cost figures. This promises to be a major problem for management in the '60s.

III. New Possibilities

Rapidly changing technology is constantly opening up new possibilities for substitution of materials; the "make-or-buy" problem is becoming complex for even the small company. By careful study, companies can make large savings on even routine purchases. "Value analysis," which is more a question of outlook than formal technique, offers a systematic approach to inventory control, size of purchases, material specifications. The purchasing manager—or "manager of materials"—is winning acceptance as one of top management's most important aides.

• **Cooperation**—In many areas of management, small companies are finding that cooperation pays off. There are a number of examples today of pooled research, pooled purchasing, pooled sales forces; and these are providing smaller companies with services and savings they could not enjoy alone. In some countries, there are even bookkeeping centers where control records are produced from raw records. The years ahead will see

more such pooled resources; and perhaps many of the "pools" will turn into consortium and formal corporate organizations.

IV. Big Business

For larger companies, what is happening today at B. F. Goodrich (see Management Methods) is typical of the changes that will take place in the next few years.

First of all, note that the president of Goodrich came up through staff positions rather than through operating departments. Also, President Keener strongly believes in the "marketing concept"—that planning starts with the customer. And he believes that standards should be set in terms of profitability, not in terms of efficiency for efficiency's sake.

Note also that Goodrich, like many other companies, converted to a decentralized organization in the '50s. Now the company is tightening its central controls—what President Keener calls a "rounding off" of decentralization, rather than recentralization. For the next few years, managers of larger corporations will be searching for the best balance between centralized and decentralized authority.

• **Battle for Status**—The decade ahead will see some fierce struggles for status. In the most progressive companies, the marketing manager has already gained top management status, and he will continue to make gains everywhere.

But the changing pattern of physical distribution may call for some other changes in organization. In some companies that have reorganized, a distribution manager has been appointed, with equal rank and responsibility to managers of marketing and manufacturing. His job is to run a department combining a number of previously scattered functions: finished goods inventory, transportation and traffic, warehousing, order-processing, credit, customer service, container design, sometimes production planning.

• **Into the Future**—These battles for status are insignificant to what may happen in the 1970s and '80s. Progressive managements are already giving serious consideration to the implications of what is being called "information technology"—techniques for data processing, and the application of mathematics.

Two American professors, writing in the *Harvard Business Review*, recently predicted that the new technology would lead to a recentralization of business organization. Top management, they say, will take over a large proportion of the "creative" functions such as innovating and planning; and most of the decisions currently made by middle management will be governed by specific operating rules. Thus, middle managers will either move upward into staff positions near the top, or move downward in status and compensation.

Contrasting with this approach is the "human-relations" idea that only decentralization makes use of the "whole man," and is thus sociologically, perhaps economically, more desirable. The next decade will see increasingly bitter debate over the merits of decentralization versus centralization.

• **Emphasis**—There does seem to be agreement, however, that tomorrow's technology will call for a much larger component of indirect labor. As a result, there will be emphasis on groups rather than individuals in the organization. Research into group behavior already points to predicting which work groups will cause trouble, which will have high and low productivity.

What will replace the individual incentive schemes of today? The "conservative" school of thought favors no incentives at all, on the theory that management's responsibility is to get out the work, that an honest wage is incentive enough.

More radical thinkers look to group incentives. The reason: Group incentives offer many of the advantages of participative management, but can function within a highly-structured organization. Also, ways are being found to measure productivity of groups, and with this, management will be much more disposed to pass on a share of productivity increases.

There is a "third force," of course, that cannot be forgotten. Organized labor is making rapid strides around the world, and many of management's debates will be settled by collective bargaining.

Technology:

RESEARCH SPENDING has been moving upward and upward in every corner of the world. You see the sharp pace in U. S. figures: about $2,000-million in 1947; $6,000-million in 1954; $8,500-million in 1956; an estimated $12,500-million last year. This is from all sources, public and private. And the same pace is reflected in world estimates —about $20,000 for research and development during 1959.

Such R & D spending casts an impressive shadow ahead—the prospect of great industrial growth in the next five and ten years. It will bring a deluge of new methods and techniques in the 1960s, an endless flood of materials, products, new machines and processes, energy sources. For the businessman, it will mean a series of competitive challenges and opportunities.

Economists say that only 10% of products coming out of the laboratory survive in the market place. The products and techniques that do succeed will be those that weld a sound engineering idea with a real human or industrial need, and combine these with effective economic planning and marketing.

New products grow out of new materials and new thinking. No one can predict what specific new products will be available in the '60s. The clearest indication are the items now moving out of research—plastic buses and railcars, cars without wheels, ultrasonic dishwashers, superior drugs, foods, textiles, footwear.

I. Better Materials

New and improved materials have paced the technical advances of the 1950's, leading to such developments as jet aircraft, atomic plants, transistors, missiles, and satellites. Almost unknown metals like titanium and silicon have come into commercial use. Now they are being followed by beryllium, zirconium, novel ceramics and glasses.

The '60s may or may not see the debut of as many basically new

Challenges and Opportunities

materials as the past decade, but it undoubtedly will witness revolutionary improvements in those that have already made their appearance. Substitution—and a close study of competitive materials—will be a key aspect of the coming decade. Factories and the consumers will have more to choose from. Aluminum and plastics have moved into new fields, but steel and nonferrous metals are being improved.

Steel men see no radical changes in their product during coming years, but steady, evolutionary improvement of strong, corrosion-resistant alloys. And they aim to reduce the cost of steelmaking.

• **Many, Many Plastics**—Scores of new synthetic resins continue to come out of chemical laboratories, and they have an endless variety of attributes and properties. Some compete with wood and paper, others with metal and glass, still others with leather, fibers and rubber. Note that world consumption of synthetic rubber this year will for the first time be larger than that of natural rubber.

The beauty of plastics is their versatility. Coupled with this is the fact that they can be produced as a liquid from water, air and petroleum, then molded into any shaped desired. The end product can be as hard as steel, or as soft and pliable as tissue paper.

World output of plastics is expected to more than double in the next ten years, and to find much greater use in construction, automobiles, appliances, and electrical fittings. New high-strength resins, many of them still in the laboratory, will make this possible.

Typical is Du Pont's new acetal resin, Delrin, which has been developed specifically for fields now dominated by die-cast metals. A tough and rigid thermoplastic, Delrin is expected to take the place of steel and other metals in gears, bearings, firearms, hardware.

Other new resins may pave the way for the mass-produced all-plastics car and house. The amount of plastics going into both has been increasing steadily. Several sports cars now have plastics body shells, as well as dashboards, tires, belts, steering wheels, made of synthetics. Houses have plastic pipes, partitions, counters, blinds, and electrical fixtures.

• **Man-Made Fibers**—More new resins will mean more synthetic fibers. In the past decade, nylon has been joined by a robust development of polyesters (Dacron, Terylene) and acrylics (Orlon, Acrilan, Dynel, Tacryl). Also on their way now are other promising acrylics, vinyls, polyolefins, tetrafluororethylenes, glass fibers, as well as modifications of rayon and acetate.

Showing great promise as we enter the '60s are polypropylene and polyethylene. Both resins are expected to produce low-cost fibers, and be strong competitors with the existing synthetics, cellulosics, and natural fibers.

• **Advances in Medicine**—Medical researchers foresee a series of breakthroughs during the next ten years that will outshine the so-called "wonder drugs" of the past. Near at hand are promising remedies for the mumps, measles, varieties of the common cold, arthritis, and several mental disorders. Coming out of laboratories a little later, perhaps in the mid-1960s, are remedies for heart disease and some types of cancer.

Chemicals now being tested in clinics may change the entire science of psychiatry. Known as "psychic energizers," they attack the same problem as tranquilizers —severe depression—but give more positive and dramatic relief. Experimentally, they have been shown to take the place of electric shock treatment, and give chronically depressed persons a completely new outlook on life.

Drugs that cure certain types of cancer also should be in the hands of doctors within ten years. Several promising remedies already are being given extensive tests in cancer hospitals.

II. Tools and Systems

The 1960s should see marked advances in control by computer—automated warehouses, machine shops, chemical plants, petroleum refineries—and greater use of radioisotopes. Ultrasonics will have many more applications. And industry will be far closer to standardization on a world scale, which will mean better use of its advanced tools and systems.

• **A New Generation**—Ten years ago, the computer was a mathematical wonder. Now it is becoming a commonplace piece of furniture in offices, banks, factories, and warehouses. Dozens of companies make computers of one kind or another. These machines do much more than figure and compute: they serve as the "brains" of complex machine tools, automated chemical and petroleum plants, inventory systems, and information retrieval programs.

In the '60s, two trends will continue—the smaller machine, the versatile application. The day is on the horizon when computers the size and price of adding machines will be available. They are being made possible by further miniaturization, advances in electronics and transistor materials.

Computers soon also will supply the "brains" for the mechanized handling of mail and bank checks. Both are on their way. Semi-automatic post offices now are going into operation in the U.S.A. and Europe. They can be completely automatic—substitute data processing machines for push-button operators —when the style and type of printed data on mail becomes standardized.

Far more closed-circuit industrial TV is coming, as cheaper trouble-free equipment moves into the market. Systems now aid industry and commerce in scores of different ways, and others are constantly coming to light. Typical: stockholder meetings at several different cities joined together by TV; doctors at a medical convention watch a televised version of an operation at a nearby hospital;

cameras placed in fuel towers, pipelines, under freight cars, in boilers, furnaces, atomic reactors, to facilitate inspection and control.

• **Revolution in the Machine Shop**—Further automation will come to machining and metalworking operations. These techniques formerly were available only to mass-production operations. Now they will come to job shops and to factories that turn out only a few items in a sequence—through the use of magnetic and punched tapes that control the machines.

New techniques have been developed that simplify the job of programming these tapes. Drawings can be quickly translated into dimensions and instructions on tape —and then the tape can direct the machine tool through a series of intricate cutting, milling, boring, finishing movements.

On the horizon also is greater use of "building block" tools. These are sectionalized machine tools, which can be increased or changed to do new jobs.

What direction these systems are taking was evident at the recent European Machine Tool Show at CNIT, near Paris. Shown were advanced machines designed to function as self-contained units in flexible automated production lines. Machines and units can be pulled out and replaced, lines reformed to do different work.

• **Rays Find New Jobs**—Radioisotopes were practically unknown to industry ten years ago. Now they are saving manufacturing, agriculture, and medicine an estimated $1,000-million a year. Their uses may double or triple in the next few years.

To date, isotopes have been employed largely as tracers and gages —reporting on the thickness of metals and plastics, the impurities in food, drugs, cosmetics, the flaws in metal parts. But rays also change matter, and their ability to do this will prove profitable in the Sixties. Two fields show promise: 1) the chemical synthetis of new or improved materials; 2) the pasteurization and preservation of foods.

Experiments have shown that the properties of many materials can be improved by subjecting them to ray treatment. Radiated wood acquires new strength, radiated coal acts like high-test fuel. Rubber and plastics show new qualities. Irradiation often speeds up the chemical changes in a material; in other cases, it results in compounds that can not be secured through normal chemical procedure.

Irradiation of foods is still in the research stage in both the U.S.A. and Britain. But tests have already shown that the shelf life of vegetables, fruit, meat, and fish can be substantially increased by this means. Continuing research is aimed at finding out just how much radiation should be used for different kinds of foods, for optimum preservation without any sacrifice of nutritional or taste qualities.

III. Energy Sources

The world's estimated 3,500-million people will require huge quantities of energy in the '60s for their homes, factories, transport. They will still get most of it from conventional sources—coal, petroleum, natural gas, falling water. All of these still will be in abundance, and they probably will remain the cheapest source of power.

• **From the Atom** — Atomic energy will become a commercial reality in the '60s—though its total output will be meager compared to other sources. Only in Britain will reactors provide a major share of the nation's electric needs. Factories and homes in the U.S.A., Italy, France, Japan, India, and a few other countries will use only token quantities for several years to come.

Energy from atomic fusion is many years away, though important research strides are expected to be made in the coming decade. Scientists are looking far ahead when they talk about generating energy by fusing hydrogen and light atoms—to the day when uranium as well as fossil fuels may be scarce.

Researchers recently have discovered that they can produce commercial quantities of electricity by rushing hot ionized gases through a cold magnetic field. Further research on the system—known as magnetohydrodynamics (MHD)—now is being backed by ten big U. S. power companies. The initial MHD studies were done by Avco Corp., which now is building a 100-kw MHD generator to answer questions about the cost of power generated through the new system.

• **Energy Without Steam**—Energy for the '60s—for transport, as well as stationary units—may also come from a wide variety of batteries and fuel cells now under development. These convert chemical energy directly into electric energy—without costly furnaces, reactors, steam plants.

The highly-promising fuel cell is essentially a battery that does not consume its own elements. It offers high energy output per unit of fuel. But most of the cells now under development use expensive hydrogen and oxygen as feeds. Further commercial use will come, probably in the near future, as researchers find effective means of substituting air for oxygen and cheap hydrocarbons for hydrogen.

The atom itself may play a role in the direct conversion of electricity. An inkling of this came out of a recent experiment at U.S.A.'s Los Alamos atomic laboratory. Scientists generated small amounts of electricity by lowering a tube of gas and a rod into the core of a reactor.

• **Atomic Transport**—Before the decade is over one or more atomic planes undoubtedly will be experimentally flying the skies. They may or may not prove practical for many years to come, depending on what new materials are made available to reduce weight and improve radiation shielding.

Atomic energy also will be powering submarine tankers, and perhaps, submarine freighters. Studies show that they can be both practical and economical. An atomic submarine can cruise at a greater speed than a surface vessel. It can go on much longer trips, and it can cut down on distance by traveling under polar ice caps.

Marketing: A Basic Economic Force

THE SELLER: He must find out, through marketing research, who will buy what, and why.

THE BUYER: He can then be "presold" through advertising, packaging, the lure of credit.

IN THE DECADE AHEAD, marketing will be recognized not just as an important technique—but as a basic economic function. Such an approach is essential if management in the '60s is to take advantage of world economic growth, stay ahead of competition, and sell the limitless variety of goods turned out by an expanding industrial plant.

According to the "Marketing Concept," all business planning starts with the customer. And more companies will find that they must "pre-sell" this customer. That means a substantial selling job must be done before the goods are actually produced and on the shelves — through marketing research, advertising, packaging, credit facilities.

The techniques are known. But they must be refined, by able professionals. Perhaps the most important advance in marketing in the '60s will be the appearance of more competent marketing specialists. The '60s will see an upgrading of advertising agencies, marketing research groups, package designers, and consultants around the world.

Here are some important trends:

I. Retailing

There will be more chain and affiliated stores, more self-service, fewer sales persons per customer. Vending machines will be more prevalent, selling a wider variety of goods around the clock.

The retail chain organizations will become more powerful than ever. More of them will set up quality-testing laboratories.

But more important, electronic data-processing procedures and machines are now within the means of the large retail organizations. Soon, it will be commonplace for the daily sales of a complete network of stores to be fed directly to central headquarters. This means close control over inventories; it means that fashion trends and fads will be spotted early, and exploited fully. It means the retailer will have more power over his suppliers.

Even greater changes will take place in physical distribution (see "Marketing" on another page in this issue). As the president of American Stores comments, "We can move goods through our modernized physical distribution system at about a sixth of the cost of the obsolescent seller-to-store delivery system." Palletized goods, and the use of "piggyback" (truck-rail) and "fishyback" (truck-ship) transportation, makes it possible to move goods from factory to store shelf without hand labor. And in the years ahead, there will be a surging increase in air freight.

II. Advertising

With greater acceptance of advertising, there will be less debate over whether to advertise—more about what kind to do, where, and how much. Advertising is a major element in any "pre-selling" campaign, and it will take a greater share of the sales budget.

Progressive managements are beginning to think of advertising almost as a capital investment, rather than an expense. They do not expect immediate, drastic results; they know the effect of advertising is cumulative.

Emphasis in the years ahead will be on measuring the impact of advertising—an area that is still in a primitive state. Advanced mathematical formulas are being worked out, and undoubtedly will come into use. But more important, today's "crude" methods will be used with more understanding. Direct sales is the best measure, of course; but indirect measures are important—such things as the customers' awareness of a company, its products, brand names, and advertising themes, and the acceptability of its advertising claims.

With the exception of outdoor techniques (where technical advances may well be dramatic) advertising practice in the '60s was summed up by one practitioner: "The cards may be redealt a bit, but the game will be the same."

III. Television

"Wherever television advertising has been introduced," the magazine *Advertising Age* recently commented, "it has turned out to be a major medium for advertisers." The top 20 British advertisers, for instance, are now putting more money into television than in newspapers or magazines. "Considering that commercial television is only four years old in Britian," observes *Advertising Age*, "this is a veritable overnight revolution in advertising planning—and a foretaste of what is likely to happen in other countries."

France and Switzerland are currently the major holdouts against commercial television. Common market competition will force France to change its attitude. And the "sandwich system" of limiting advertising to one short period a day, currently enforced in several countries, will surely be abandoned.

Color television will make continued gains in the '60s, but black-and-white will be the dominant influence until the '70s.

IV. Marketing Research

What kinds of goods do people really want? This question is the keystone of the "marketing concept," and the marketing researcher must answer it. He must provide guidelines on product preferences, patterns of consumption, attitudes toward advertising, why people buy.

Techniques such as motivational research will become less controversial, less misunderstood. They will find their proper place as just one more valuable research tool.

There will be more stress on finding out what the consumer will do—his plans for spending, his feelings about the economic situation. Bold adaptations of statistical techniques have already been made in this direction. The Survey Research Center of the U.S.A.'s University of Michigan now makes periodic surveys of the consumers' state of mind, complete with indexes in degrees of optimism and

pessimism. And the survey has already had a triumph—it predicted the '58 downturn in U. S. sales.

But the first step in marketing research is still population statistics, and income figures. The next decade will see some fundamental changes in population age-groups. The death rate is decreasing, educational level will be higher the world over; there will be more leisure time. These trends can be converted into market predictions.

In the U.S.A., for instance, there will be a spectacular increase in the 18-to-25 age group. As a result, there will be a high rate of family formation, with a surge in demand for such things as small and used cars, small homes, children's clothing, furniture, etc.

Also of basic importance is the improving standard of living around the world. The "working class" becomes a consuming class, and consumer expenditures will reflect this change. The pattern is already clear in Europe: During the past decade, there has been a tremendous upsurge in private motoring, and substantial increases in spending for household goods and appliances, clothing and footwear, fuel and light. As living standards improve, "discretionary income" becomes a dominant market factor.

V. Credit

Until recently, consumer credit was just another field of finance; now it is considered as a major marketing tool. An American economist explains why: "What the credit plan really does is speed up the buying decision and move the goods at the time when the desire to buy is strong—a desire that might cool in the months it would take to save to buy outright."

Far from doing away with "thrift," as some critics have charged, credit on reasonable terms actually forces people to budget more carefully. And many economists now consider consumer credit as a form of saving.

Perhaps more than any other index, the growth of consumer credit reflects an increase in living standards. Outstanding consumer debt in the U.S.A., for instance, has grown in recent years almost directly in proportion to the number of families eligible for credit.

In the industrial field, capital conservation is a better explanation of the increasing use of credit; but even here, manufacturers are finding that credit can be a sales tool. The growth of equipment leasing (IMD, Dec.) shows that.

VI. Packaging

In its fullest meaning, packaging implies not only container design, but design of the product itself for beauty as well as function. The acceptance of packaging as a sales tool is almost tantamount to adopting the "marketing concept." And packaging is a logical place to propagate a "company image."

In the container field, you will see more packages with self-opening and self-closing devices; more packages designed as dispensing units; more shipping containers that convert into display pieces. Propellent bomb" packaging will spread.

In the consumer field, the emphasis will be on convenience, and the ever-greater problem of calling attention to products that differ only in package design.

The next decade will see tremendous competition between packaging materials. Plastics, with their almost unlimited ability to be formed, will hold the spotlight. ●

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Photograph by courtesy of OSLO LYSVERKER Oslo, Norway.

Here is a current example:
The offices of the OSLO Electricity Supply Company cover 10,000 square metres. Until recently the linoleum covered floors were cleaned with soap and water by a staff of 45 women—but results were not satisfactory. Five Cimex 'Vultures' and one 'Dipper' were purchased and Cimex cleaning methods introduced. The floors are now scrubbed only once a year, but are polished with 'Vultures' twice a week and cleaned daily with a damp mop to remove dust and scuff marks, emulsion wax being applied only when necessary. The cleaning staff has now been reduced to 22 women each of whom spends only 3 hours a day on the floors. The results of the first year's work are impressive—a saving of £4,250, the appearance of the floors first-class, while the work is easier and the cleaning staff happier.

The above case is typical of the results obtained by Cimex equipment used in conjunction with Cimex cleaning methods and is happening in factories, offices, stores, hospitals etc. throughout the world.

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Of course we realize that the ladies understand just as much about automobiles as do the men – they merely look at them with different eyes. Not long ago, one of our dealers was visited by a young couple inquiring about the new, improved 180, 180 D, 190 and 190 D models. She scarcely heard that the 180 and 190 motors had been improved with an increase in power; or that the brakes on all models were now far safer and more efficient – frankly, she was admiring the new rainbow-range of available colours.

His interest was attracted to the new yet still characteristic profile of the cars while she tried the new security steering-wheel... how easily it spun in her hands from lock to lock! As he tested the tremendous new bumpers, and quite rightly made an inspection of the super-safe, double-locked doors – she had already given her stamp-of-approval to the long-lasting, luxury upholstery and just for fun had tried out the new automatic windshield-washer with great success! But, after all, that's just a small difference. Everyone has his own particular interests and desires – Mercedes-Benz does its best to fulfil them all! These world-famous, world-accepted and world-desired cars are truly built for him – and for her.

This young couple and everyone else, it seems are impressed by the security – enthusiastic about the roadability – thrilled by the beauty. Women love elegance, comfort, and attention to small details. Men desire ability and stability, confident appearance and modern technical development. And, what's more – they are both right.

Naturally, they have one thing in common – a thought to economy. Here Mercedes-Benz offers the pleasantest surprise for all. With all this new value the price of these cars has remained absolutely the same.

INTERNATIONAL
MANAGEMENT'S

Technology in Brief

New Shoes: No Shine, No Stitching

U.S. store windows will soon display footwear made with "Evershine" leather—chemically treated to resist dirt and moisture and requiring no polish. Also, new types of soles—many of vinyl plastic—can now be attached to uppers by injection molding instead of stitching, making the shoe watertight and more flexible. (Business Week, Nov. 7, p 86)

Nickel Plating of Aluminum

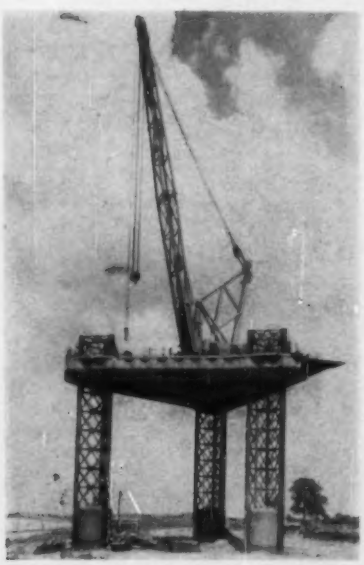
An efficient new method of coating aluminum with nickel has been developed by Canada's Naval Research Establishment. By adding a small quantity of nickel chloride to a fluoborate plating solution, it is possible to nickel-plate the aluminum directly with good adhesion and ductility. (Product Engineering, Nov 16, p 11)

Plastics Wedded to Hot Metals

Liquid plastic applied to hot metals by a new process has the advantage of not cracking or chipping during application. Coatings can be applied accurately in a wide range of thicknesses and are corrosion-resistant. One interesting application: painting long pipes, both inside and outside. A South African scientist developed the technique and the Engelhard group of companies is promoting it throughout the world.

Tiny Turbine for Ground and Air

A new gas turbine weighing only 34 kilograms operates on any fuel from kerosene to highly-leaded gasoline. Patented by the Williams Research Corp., of the U.S.A., this unit develops 75 shaft horsepower and weighs only one-third the weight-per-horsepower of other regenerative gas turbines. Williams has already licensed several firms to produce this machine for ground operations; an aircraft version may be available in about a year. (Chemical Week, Nov 14, p 79)



Mobile Bridge Builder

A gigantic bridge-building machine is at work on a 9.6-km. concrete span across Venezuela's Lake Maracaibo. The 2,000-ton floating "bridge builder," made by R. G. LeTourneau, Inc., U.S.A. consists of a powerful marine crane and a hydraulically-operated three-legged platform. After completing a section of the bridge, the platform lowers itself to the waves, raises its legs from the lake bottom, then moves forward. The platform of this $1.5-million mechanism is similar to many mobile platforms now used for offshore oil drilling operations in the Gulf of Mexico and elsewhere. The crane is powered by seven electric motors, which get energy from diesel engines totaling 1,200 hp. An unusual feature of the bridge builder is its "self-leveling device": If one leg settles more than the other two, the electric motors on that leg are reactivated to bring the platform up to level again.

Machines Aid Packaging Advances

MACHINERY MAKERS are moving swiftly to keep their equipment abreast of today's demand for new packages and packaging materials.

The latest packaging machines are faster, more versatile, more economical—and more automatic. Some combine two or more packaging functions in a single unit. They show greater efficiency in handling plastics and metal foils, and there are improved ways of handling labeling and printing problems.

The trends were evident at two packaging shows in recent months: the sixth biennial International Packaging Exhibition & Convention in London, and the Packaging Machinery Manufacturers Institute Show in New York.

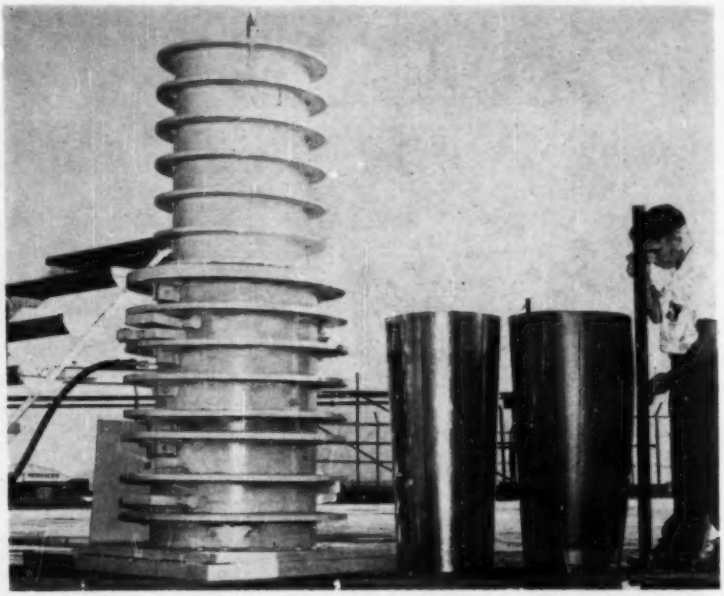
• **Aerosol Filling**—The New York show featured a low-cost (about $6,000) aerosol unit said to be capable of pressure-filling 600 cans an hour. It is self-contained and semi-automatic, and requires only the product and propellant, plus electricity, to be put into use.

Shown at London was a Swiss machine that achieves faster aerosol filling by inserting the propellent charge between the valve and the can rim, rather than through the valve. The can is immediately crimped at the same station.

• **Printing Improvements**—The U. S. show displayed an improved method of transferring imprinted four-color labels to film or foil; new techniques in printing cartons and multi-wall bags on a production line basis; and a moderately priced (around $1,700) labeling machine for round containers. There was also a prototype of a stencil machine that cuts shipping stencil from a punched tape.

A printing technique shown in London employed a British machine that dry-transferred impressions onto cartons, plastics, metals, and glass by heat and slight pressure. The printing matter is first preprinted in reverse on the underside of a reel of vinyl tape.

• **Speedy Wrapping**—A German manufacturer intrigued London visitors with an automatic machine that wrapped individual pieces of hard candy in heat-sealed film with a tear tape. The machine is said to wrap 500 pieces per minute, and to save 20% in packaging-material costs. The tear tape is imbedded in the edge of the wrap during forming, filling, and sealing. The machine's speed is equal to that of the latest twist-wrap units shown at London and New York. (*Chemical Week, Nov* 28, *p*65; *Modern Packaging, Nov, p* 164).



EXPLOSIVES-formed aluminum tank section at right, using split die at left.

Metals Exploded into Dies

THE GROWING IMPORTANCE of explosive forming was revealed at a recent meeting of the U.S.A.'s National Metal Congress, when a third of the audience revealed they were either working with explosive processes or planning to do so soon.

The speakers showed a variety of unusual test parts formed by the new method. There were a large engine housing, dies for electrical discharge machining, an auto trim strip. One shim-thick stainless steel gasket containing many holes of different diameters was produced by a female die in one shot.

• **Economical** — Explosive forming has advantages in performance and economy, especially where workpieces are large, complicated in shape, and made of very tough materials. In the missile industry, in particular, explosive forming is sometimes the only way to shape certain new high-strength, high-temperature metals. And experts state that handling explosives is no more dangerous than handling other modern tools.

Metalworking men point out the importance of knowing which explosive to use in order to get successful forming and hardening. Basically, there are two types: low-pressure explosives (better known as propellants) such as black powder; and high-pressure explosives. The latter have the advantage of greater, more constant pressure.

At the congress mentioned above, DuPont exhibited a new sheet explosive made from pentaerythritol tetranitrate. It is waterproof, resistant to impact, and conforms to practically any shape. It is now used chiefly for hardening austenitic manganese steel. (*American Machinist, Nov* 16, *p* 125)

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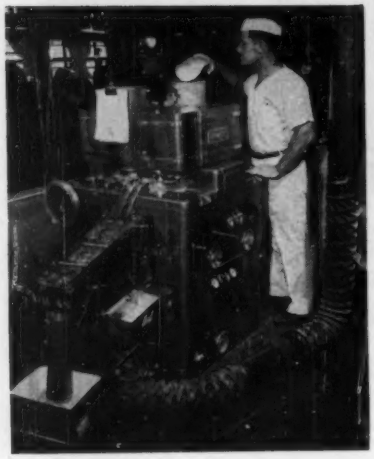

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Eli Lilly & Co. uses this Stokes Model 540 rotary tabletting machine to produce a variety of products at rates up to 130,000 per hour. Stokes rotaries afford peak economy for high-speed, precision tablet production. Set-up and adjustment are the easiest ever offered.

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ROTATING engine may provide a compact, vibration-free source of power.

Engine Fires Continuously

A PROTOTYPE of an engine with only two moving parts—a rotor and a crankshaft—in place of multiple pistons, connecting rods, valves and camshafts was unveiled recently in the U.S.A. and West Germany.

The new rotating engine, developed jointly by U.S.A.'s Curtiss-Wright and Germany's NSU Werke, weighs only about half a kilogram per horsepower, compared to the kilogram per hp of a piston engine. It is much quieter than a normal combustion engine, free from vibration, and uses low-octane gasoline at a low rate of consumption.

The engine provides an almost continuous cycle of fuel intake, compression, ignition, expansion, and exhaust. Curtiss-Wright believes it combines the best features of piston and jet engines—high efficiency and work continuity.

• **Rotor with Three Sides**—The claimed efficiency for the comparatively simple engine is based on the special configuration of the three-sided rotor and the somewhat oval housing in which it turns. Working on a trochoid principle, the turning of the rotor compresses fuel and air successively into the three chambers made by the rotor's sides and the housing.

An automotive carburetor supplies the mixture of gasoline and air into the housing through a side wall port. The mixture is fired by a single sparkplug as it reaches its highest compression. The exploding gases deliver the power to the crankshaft set inside the rotor. Exhaust fumes escape through another port.

Curtiss-Wright has not released full details on the engine, but officials say that 100 to 700 hp models will be in production later this year. The first units are expected to drive trucks, buses, helicopters, and small airplanes. Others may go into compressors, pumps, and tractors.

• **Low in Cost**—Though no price range has yet been suggested for the new engine, Curtiss-Wright states that it will be "low in cost because of its simplicity and absence of exotic materials."

Curtiss-Wright has exclusive rights for the engine in aircraft applications throughout the world, and exclusive rights for all other purposes in the U. S. A., Canada, and Mexico.

NSU, a West German manufacturer of automotive equipment, has been developing units of the rotating combustion engine in the low horsepower range. These are expected to go into the company's cars, scooters, and motorcycles. ●

Diamonds . . . . . Man-Made

TWO IMPORTANT EVENTS in the field of synthetic diamonds made headlines in late 1959:

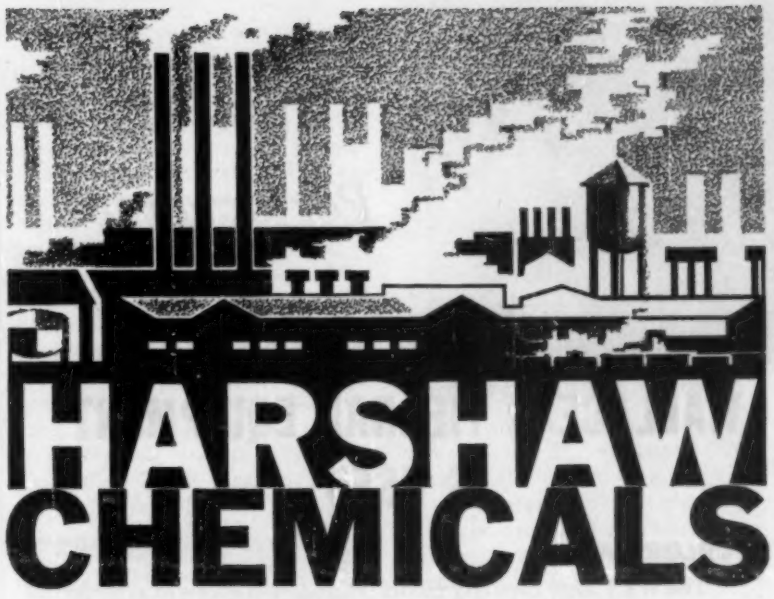
—**General Electric Co.** of the U.S.A., the first producer of industrial synthetics on a commercial scale, divulged its manufacturing process;

—**DeBeers Consolidated Mines** in Johannesburg, South Africa, announced it has developed an industrial synthetic of its own.

The GE revelation, published recently in *Product Engineering*, reports that industrial diamonds (80 mesh or finer) can now be produced within a few minutes. Discovery of a molten-metal catalyst was the practical breakthrough that made this development possible. Platinum, iridium, osmium, palladium, rhodium, ruthenium, chromium, manganese, iron, cobalt or nickel all can be used as the catalyst. While tantalum is said to be particularly effective for inducing the growth of small diamond crystals, its activity is less than other crystals under certain conditions.

• **Technique**—*Product Engineering* reports that the number and kind of synthetics formed is affected by the nature of the starting material. Best results are obtained with substantially pure graphite. But other sources of carbon, such as carbon black, sugar charcoal, or carburizing compound can be employed. Shaping, color and other characteristics are governed largely through temperature of formation.

GE's catalytic technique requires a specially-shaped structure for handling the required temperatures and pressures. High-strength pistons and a chamber are made of cemented-carbide. Conical gaskets of pyrophyllite, a form of aluminum silicate, are part of a unique pressure-sealing technique that also permits motion through compression and flow. In addition, the use of pyrophyllite serves as a thermal and electrical insulation, enabling the pistons to remain comparatively cool. High temperatures are obtained by passing an



HARSHAW CHEMICALS

for WORLD INDUSTRY

Here are some typical HARSHAW Products

CERAMIC—Ceramic Colors for pottery, glass and porcelain enamel decoration—Uverite (Frit Opacifier)—Antimony Oxide—Tin Oxide—Nickel Oxide—Chrome Oxide Green—Cadmium Sulfide—Liquid Bright Gold.

PAINT, VARNISH, AND PLASTIC—Naphthenate Driers and other Metallic Soaps (Linoresinates, Octasols, Resinates, Soyates)—Cadmium Lithopones—Pigments—CP Cadmium Pigments—Mercury Cadmium Pigments—Antimony Oxide—Organic and Inorganic Dry Colors and Dispersions—Vinyl Stabilizers.

ELECTROPLATING—Nickel Salts: Sulfate, Chloride, and Carbonate—Nickel Anodes—Cadmium Oxide—Bright Nickel Electroplating Processes.

CATALYTIC PROCESSING—Preformed Catalysts—Boron Trifluoride—Hydrofluoric Acid—Nickel Formate—Rufert Nickel Catalyst Flakes (for vegetable oil hydrogenation).

MISCELLANEOUS—Hydrofluoric Acid—Ammonium Bifluoride—Miscellaneous Fluorides—Copper Chloride—Copper Oxide—Copper Naphthenate—Cobalt Sulfate and Carbonate—Manganese Carbonate—Cadmium Oxide—Synthetic Crystals (Optical, Scintillation, Electronic).

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Fertilizer
Food
Glass
Insecticide and Fungicide
Laundry
Leather
Lithographing
Linoleum and Floor Covering
Lubricant
Match
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Wall Paper

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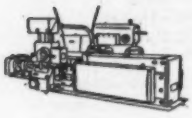
CHLORINATION

The W&T high capacity chlorinator shown above at a steam generating plant is used for chlorination of cooling water to eliminate slime formation on condenser water-side surfaces. The W&T chlorinator was chosen because of its accuracy, dependability, and simplicity of operation. These qualities are typical of Wallace & Tiernan's complete line of chlorination equipment which is widely used both in industry and in the protection of public water supplies.



PROCESS FLOW CONTROL

Equipment includes chemical solution feeders, gravimetric and volumetric dry feeders, and gravimetric meters for use in the chemical, grain, and food processing industries.

AIDS TO NAVIGATION

Includes a number of protective devices for navigation such as buoys, lamp changers, flasher mechanisms, signal timers, fog horns, aircraft flasher units and other related apparatus designed for use in the marine and air transportation field.

PRESSURE SENSITIVE INSTRUMENTS

Equipment includes a complete line of aneroid and mercurial pressure sensitive instruments, such as altimeters, barometers, and manometers designed for use in industrial testing as well as for research purposes.

Other quality Wallace & Tiernan products and services used throughout the world are listed below. For further information send for list number F-106 of available free technical publications on all Wallace & Tiernan products.

Ammonia Control Apparatus — Cathodic Protection Systems — Chemical Feeders — Chlorinators — Decay Control Process for Produce — Electric Marine Beacons — Flour Processing Chemicals — Pharmaceuticals — Precision Instruments

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REPRESENTED IN MOST COUNTRIES

F-106

electric current through the sample supported by pyrophyllite.

• **Competition**—*The Economist* of London predicts continued strong competition between GE's synthetics and natural stones supplied by the DeBeers diamond syndicate. However, the availability of the new synthetic process to the syndicate should permit it to meet the price-challenge posed by GE's synthetics. Now, the syndicate will be able to furnish either natural or synthetic stones in the field where competition should be keenest—use of diamonds in resin-bonded grinding wheels. ●

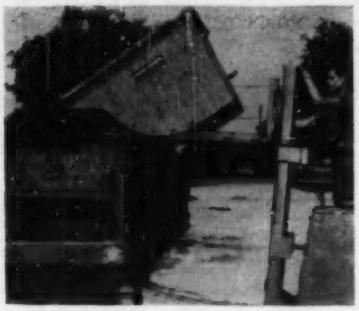
New Welders . . .

. . . **From Italy.** Gaico Co., of Turin, claims it is the first to make a continuous, rotary plastic welding machine. According to Gaico representatives, this machine is capable of uninterrupted, infinite length, straight, curved, or out-of-phase welding ability, allowing an output of up to 10,000 pieces per hour at minimum cost. The welding material is polyvinyl chloride. But other materials can be used if the electronic circuit or frequency is varied.

Hourly production of the machine is a function of the speed and of the dimensions of pieces to be welded. Properly equipped, it can also weld containers of any shape desired. In addition, the machine is said to replace seven to ten conventional welders and operators. (*Product Engineering, Nov.* 30, 1959, *p.* 28).

. . . **From England.** A welding transformer with coils of anodized aluminum foil instead of copper offers a new and potentially significant use for aluminum. This machine, said to be the first commercial application of aluminum-wound transformers, was developed by the Ashton-Young Engineering Development Co., of Kingston-on-Thames.

The welding unit weighs only 30 kilos, the transformer is slightly smaller than a portable television set. Two other features help to keep weight far below that of the traditional copper transformers: use of fiberglass for the transformer case; and natural air cooling in place of the usual fan on copper transformers. (*The Economist, Nov.* 21, 1959, *p.* 762).



Self-Dump Hopper Cuts Labor

Waste disposal is a speedier job when self-dumping hoppers like these are used in place of trash cans that have to be moved by hand. One U. S. company has 10 such hoppers to remove refuse: Six of these are handled by one man operating a 900-kg lift truck (picture). The other four are on casters. They are pushed to a stainless chute which discharges to the dump-truck station. All that has to be done to dump a hopper is to release the lock-handle. Then the hopper tilts forward automatically, dumps, returns to the upright position and locks. *Roura Iron Works, Inc., 1407 Woodland Ave., Detroit 11, Mich., U.S.A.*

A One-Man "Watchdog" System for the Factory

One man sitting behind a panel can guard an entire plant with Honeywell's new Electronic Security System, which was developed to counteract the rising costs of maintaining guard crews.

A central control panel (containing alarms, TV, intercom, etc.) links up with an almost endless number of remote stations. These do a number of jobs: reporting fires and intrusion, detecting noise and motion, letting workers into the plant. Signals for the entire system are sent over a single pair of wires. Each remote station inserts a certain fixed resistance into the circuit when it is activated. By measuring the resistance the man at the central panel can tell which station sounded the alarm.

• **For Instance** — As an example, here is how the system guards doors and gates. The TV screen mounted on the guard's console and a number of pushbuttons (depending on how many gates are to be controlled) give the guard visual observation and automatic control over authorized entry (by messengers, truck drivers, etc.). TV cameras at each gate let the guard survey the entire area and he can adjust the lens (from the console) to get a close-up of the person seeking admittance. He can also talk with him over a two-way communications system. Once he OK's the person, the guard pushes a button to open the gate. He can close the gate by pushing another button. *Minneapolis-Honeywell Regulator Co., 2954 Fourth Ave. S, Minneapolis 8, Minn., U.S.A.*

New German Rough-Rider

This six-wheeled German "Flexomobil," intended chiefly for carrying stores, can ride over rough ground normally impassable for tracked or crawler vehicles. The key to its maneuverability is said to be its axle design, which allows it to bend into a V. A hydraulic system can lift any of the three axles off the ground to surmount obstacles. The 3-ton Jeep-like vehicle carries a load of 2½ tons and has a top speed of about 80 km/hr. Engine is 100-hp Ford V-8 coupled to a 10-speed transmission. *Karl Kaessboher, Ulm West Germany.*

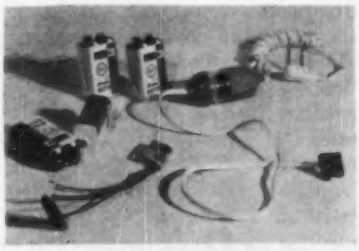
Binding at Touch of Pedal

A touch of the foot switch of this electric binder is all that is needed to bind loose-leaf catalog or data sheets permanently with a plastic binding—a 100% faster operation than with manual units, according to the maker. The desktop machine (Model 16 EB) binds pages bulking up to 5 cm in any one of five different types of binding. *General Binding Corp., 810 W. Belmont Ave., Chicago 14, Ill., U.S.A.*

Ready for Work in Forests

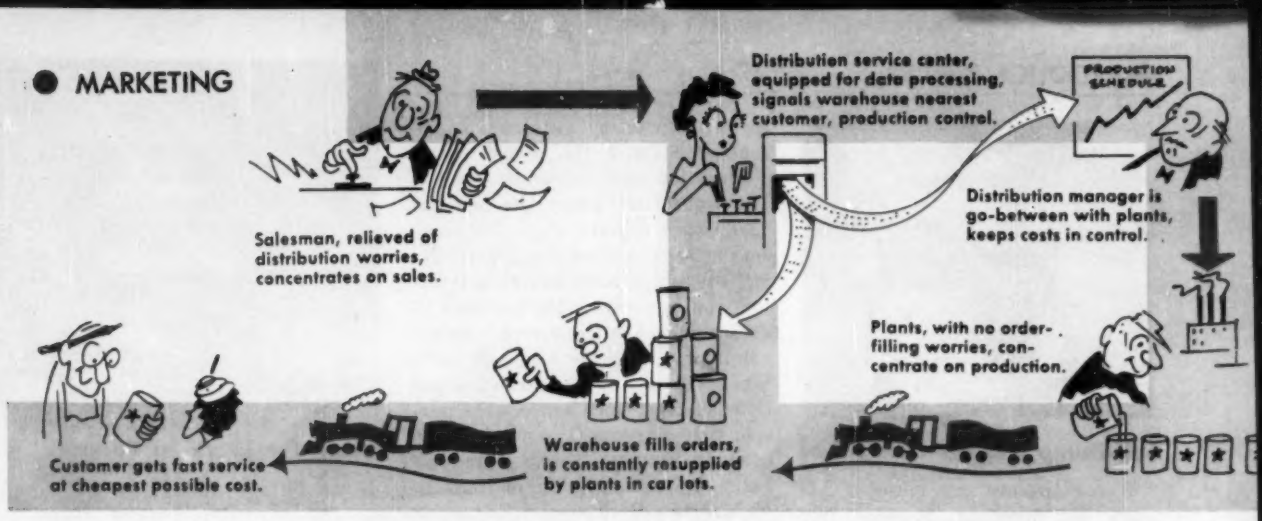
Versatility is the prime advantage of the Buschmaster forest vehicle and it is said to do the work of six or more different machines. It can be used in fire-fighting, road building, tree planting, site preparation, spraying.

The Buschmaster comes equipped with hydraulically-operated bulldozer and grading blades; a self-contained water system that holds 2080 liters and generates a water fog for fire-fighting; a back-firing unit with a flame-thrower for burning out brush; a fire plow that can cut clear lanes 2½ to 3 meters wide; and a winch. A draw bar enables it to handle scrapers, tree planters, and other attachments. One unit can protect and maintain up to 16,000 hectares of forest, according to the manufacturers. *Timberline Equipment Co., Bradley, Ill., U.S.A.*



Rechargeable Batteries for Portable Radios

These low-cost rechargeable dry batteries, for portable radios, lighting equipment, and the like, are offered in Japan. Two types are available: One with two batteries and a charger for general use; another, one battery and charger, is specifically designed for transistor radios. The built-in thermostat prevents overcharging. *Oriental Electric Co., Tokyo, Japan.*


Distribution service center, equipped for data processing, signals warehouse nearest customer, production control.
PRODUCTION SCHEDULE
Salesman, relieved of distribution worries, concentrates on sales.
Distribution manager is go-between with plants, keeps costs in control.
Plants, with no order-filling worries, concentrate on production.
Customer gets fast service at cheapest possible cost.
Warehouse fills orders, is constantly resupplied by plants in car lots.

Streamlined Routes Deliver the Goods

THE NEW LOOK in physical marketing, illustrated above, is already becoming commonplace in the U.S.A., and is catching the attention of management executives everywhere. The reason is not hard to find.

As emphasis shifts from manufacturing to marketing, companies begin to realize that distribution accounts for a major part of the cost of doing business. But standard accounting techniques tend to bury distribution costs; and even advanced cost accounting does not yet have a way to assess the part distance plays in distribution costs.

When companies do concentrate attention on distribution costs, however, they can often reduce them drastically. The U.S.A.'s Pillsbury Co., using the system above, credits streamlined distribution with a "very significant" contribution to raising its ratio of net income to sales from 2.9% to 4.9% in the last four years.

• **Pillsbury's Experience** — Distribution at Pillsbury—a manufacturer of flour products—used to be scattered through the production and sales divisions, with little liaison between them and no precise responsibilities for what happened to the goods between manufacture and delivery. "Turnover was slow, warehousing costs were high, and there was no effective central control over inventories," the company recalls.

In revamping its system, Pillsbury started at the top. It appointed a Director of Distribution, equal in status to the heads of manufacturing and marketing. This man, working with the manufacturing executive, translates the annual sales forecast into a master plan for both production and distribution. He works on three principles:

—All costs related to goods movement must be assigned to the distribution department.

—Distribution must be oriented to the customer—not to the company's plants.

—Selling, warehousing, and data-processing must be kept separate.

• **How It Works**—Today, Pillsbury's warehouses are controlled by four regional distribution centers. Since warehouse inventories are being constantly supplied by the plants, the centers allot shipments simply on the basis of the lowest transportation costs. The system guarantees third-morning rail delivery anywhere in the U.S.; under the old plant-to-customer delivery, it sometimes took a week to get an order underway.

With order-processing consolidated at these four centers, Pillsbury can afford expensive data-processing equipment at each location. Accounting units are also at the centers: Invoices go out to customers as soon as the goods arrive, and payments flow back much faster. Thanks to the data-processing equipment, credit can be given a rapid check. Traffic is handled at the centers, too, to give it efficient customer orientation.

• **Changes**—The new system has brought many changes, some of them far-reaching. Pillsbury formerly worked on the theory that its plants should be close to its customers, with each plant supplying a full range of products. Now each plant specializes in a few product lines, which permits longer production runs and better grouping of technical skills. Plant warehousing has been virtually abolished.

Field sales offices, relieved of distribution worries, now concentrate on selling. Formerly, there were 33 branch offices, each with its own accounting, credit, order-processing, and warehousing (to supply smaller accounts primarily). And now Pillsbury has expanded from 33 "branches" to 52 sales offices.

• **Variations**—Many other companies in the food industry are following Pillsbury's lead. American Stores, a retail grocery chain, is moving its meat "at about a sixth of the cost of the obsolescent seller-to-store delivery system," according to President Paul J. Cupp.

American buys its stock "on the hoof" in herd lots. At two plants in the Western U.S. sheep and cattle country, it slaughters and dresses the carcasses, loads them into refrigerated vans, then rolls the vans onto "piggyback" railroad cars. The trains run on top priority schedule to American's major market areas, where trucks speed the meat to supermarket butcher shops.

The system increases meat turnover, and this frees capital that otherwise would be tied up in inventory. The greatest savings, though, come from improved quality control and less spoilage. (*Business Week, Nov.* 14, *p* 108)

Why Did Our Sales Drop?

The Swiss watch industry puts its U. S. sales figures under a microscope.

A COMPLETE RE-EDUCATION of the American public, so far as watches are concerned, is the purpose of a $1.5-million advertising campaign now being run in the U. S. by the Swiss watchmakers' trade association, Watchmakers of Switzerland (Federation Horlogere). The campaign, the largest the Watchmakers have ever conducted, is part of a projected five-year cure of what some observers have called a "sick" industry.

The action was spurred by a report on the Swiss watch industry commissioned by the Watchmakers and undertaken by a U.S. advertising agency, Nowland & Co. It is described in a recent issue of *Advertising Age*.

What the federation aimed to discover from the Nowland report was not the facts behind the decrease in sales of quality Swiss watches—the dramatic success of inexpensive Swiss and U. S.-produced pin-lever watches, changing distribution patterns, rising foreign competition—but the "why" behind these facts.

• **Bitter Pill**—The Nowland report must have made grim reading for the Watchmakers. It found that competitive conditions in the watch industry have changed radically since the war; aggressive advertising and selling by makers of inexpensive pin-lever watches have scored with consumers. The result: The consumer no longer knows "what a good watch is and how much he should pay for it."

A table reproduced in the study sums up the situation:

—67% of consumers believe "an expensive watch is a luxury because there are so many good, inexpensive watches around."

—54% believe "you don't have to pay as much for a good watch as you used to."

—44% believe "today, inexpensive watches last almost as long as expensive watches."

Well-styled watches selling for very low prices, huge discounts on brand-name watches, and continuous advertising of "Swiss-made" watches at low prices have lowered the consumer's price standards.

If this trend continues, it could "change the entire character of the market, reducing the high-priced jeweled-lever watches to the status of specialty products."

Although more and more people want a watch chiefly just to tell the time (the "price-function" idea), the Nowland report stresses that the potential market for a quality watch is still very strong. The trouble, Nowland suggests, is that the jeweled-lever makers have been so busy fighting one another and are so obsessed with the distribution phase of the business that they have done little to stimulate potential buyers.

• **Price Ranges**—In one recent year, for example, there was a 76% increase in the under-$15 market, a 60% increase in the $50-$75 market, and a 4% decrease in the $15-$30 market.

This "empty" $15-$30 range is described as the source of many of the current troubles in the industry. In this segment are many watches without recognized brand names. This price range appeals mainly to the "price-function" group. And it is precisely this group that relies most on a well-advertised brand name.

If (the study goes on) a major brand establishes itself in this vacuum, it could become the dominant force in the U. S. market.

• **Building Up Demand**—Manufacturers should build up consumer demand for brand-name watches, then use this demand to "force a lower-mark-up on the jeweler."

The tone of the industry's advertising should be changed, the study suggests. The old prestige motive is no longer valid. Three motivations that should be stressed: personal possession; self-expression; "rites of passage" (such as acquiring a watch at graduation, etc.).

In general, the report recommends that to build up sales the industry should "increase the size of the overall market rather than fight for a larger share of a dwindling market." ●

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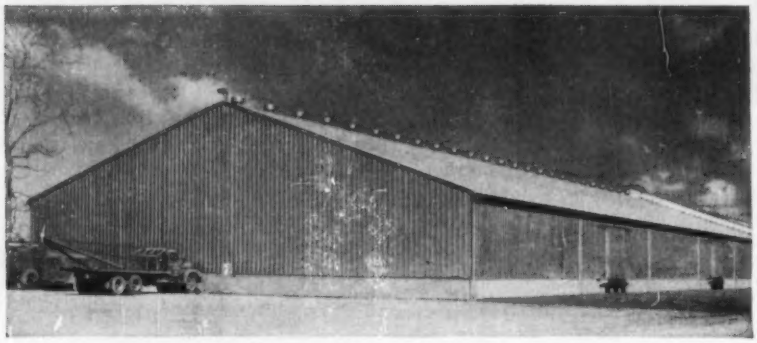
Middletown, New York, U.S.A.

MAKERS OF HAND AND POWER HACK SAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES

Butler Buildings

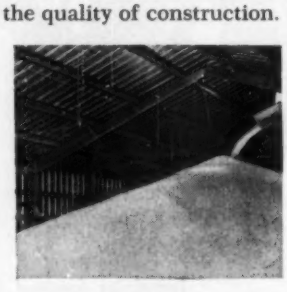


Your best building buy

The store and the warehouse above are good examples of how standardized Butler steel building components can be utilized to provide a wide variety of buildings quickly and economically.

Whether you want simple, functional lines or a more distinctive architectural treatment, you'll get more for your money using the Butler Building System.

A Butler is the lowest-cost quality building you can buy. Features such as fast erection, easy expansion, effective lighting, weather-tightness, fire safety, and post-free interiors are inherent in Butler buildings and at a low cost, considering the quality of construction. They are designed to withstand wind loads of hurricane force.



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Edouard LeClerc

Grocer Crusade Invades Paris

SHOUTING above the din of a press conference, Edouard LeClerc recently announced the boldest move yet in his crusade to streamline French distribution. His plan: open 22 "LeClerc system" grocery outlets in Paris, a bastion of the multiple mark-up.

Irate grocers, dreading the price war that LeClerc promised, broke up the meeting; but down the street, in a freshly painted garage converted to a retail store, LeClerc's Paris invasion was already underway.

LeClerc, who began quietly putting his theories into practice 10 years ago, has in the past two years blossomed into a national personality. He owns just two retail outlets himself; but outlets bearing his name, owned by independent operators who agree to abide by his principles, have spread throughout 60 selling points in France.

• **System**—LeClerc's system is simple. Bypassing the middleman, he buys his goods, all nationally-advertised food brands, directly from the producer (a new French law forbids manufacturers to withhold goods from retail operators like LeClerc).

But instead of reducing his retail

prices by this saving alone, LeClerc goes one step further: He sells at middleman prices, which are fixed by law at between 8% and 10% mark-ups. Thus he saves consumers the equivalent of the retailer's entire mark-up, or between 18% and 20%.

By holding down their overhead, LeClerc stores keep costs down to an average of 6%, which means a profit margin of between 2% and 4%. The average retailer operates on roughly the same profit margin. But there is a tremendous difference in turnover—a single LeClerc store does more business in one day than the average French retail grocer does in two weeks.

• **No Luxury**—Operating costs are held down by a simple LeClerc maxim: "I am against any form of luxury that has to be paid for by the consumer." A nationally-advertised product does not have to be sold in a fancy atmosphere, LeClerc insists, and he has a distaste for flashy chain stores and supermarkets whose overhead, he argues, is still too high. LeClerc's original store at Landerneau, in Brittany, is probably the ugliest retail outlet in France, by LeClerc's own admission. And customers must crowd into confined shopping areas and wait their turn to be served.

LeClerc regards himself more as a social missionary than a businessman; his aim, he says, is to slash the cost-of-living using LeClerc-system stores as a spearhead. He is satisfied with a relatively small personal business: Each of his own two stores does the equivalent of only about $600,000 in business a year.

To prove his point, LeClerc cites the case of his second store, recently opened in Grenoble, in the French Alps. Sales soared initially but they have now begun to dip somewhat. The important point, LeClerc says, is that other Grenoble grocers, including some of the national chains, have cut prices down to his level.

"Maybe in two years we will be just another retail operation," LeClerc comments. "But if that happens it will mean the retail price level will be knocked down considerably, and that is enough for me." ●

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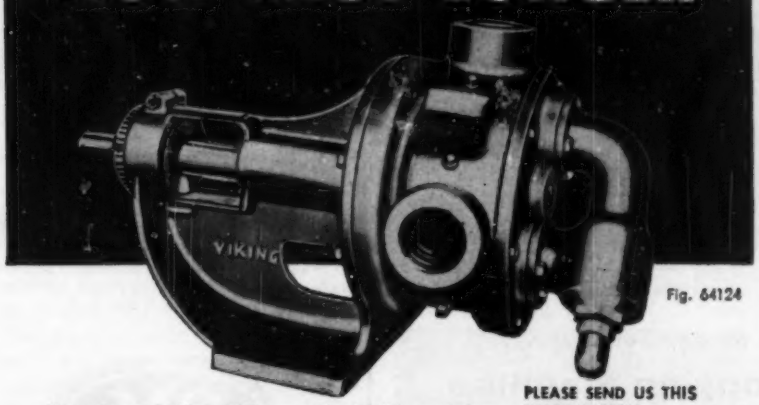

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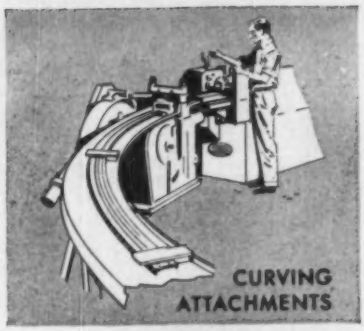

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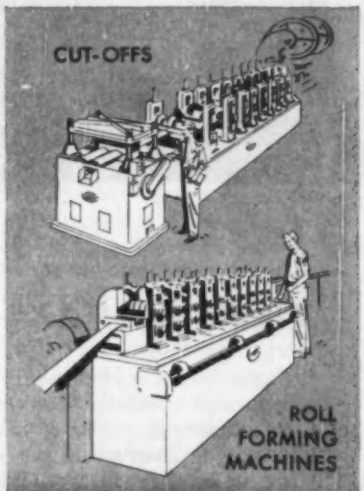

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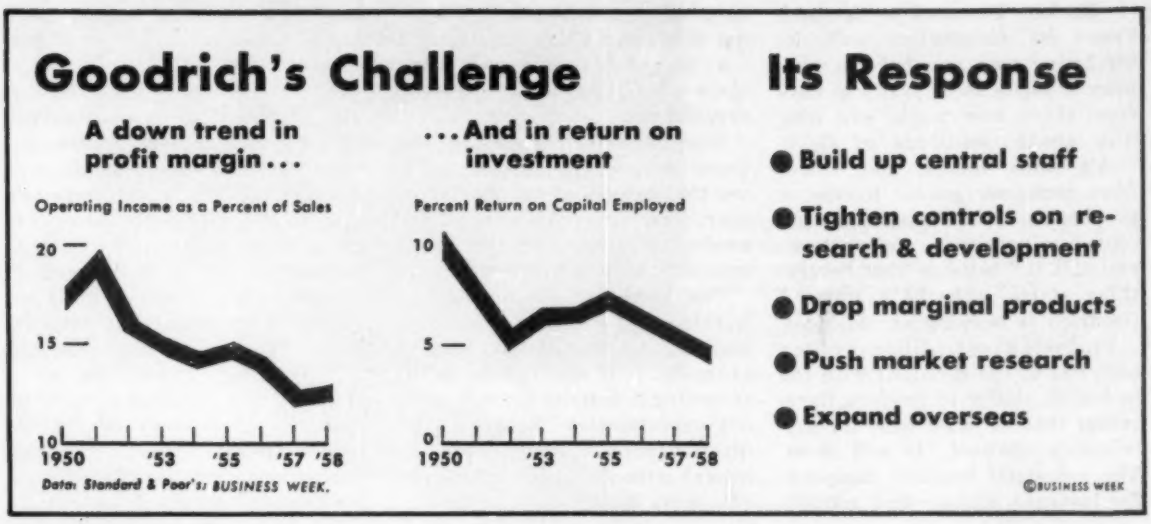

B. F. Goodrich Prepares for the '60s

J. WARD KEENER (below) does not worry that B. F. Goodrich Co. is only the fourth largest company in the rubber industry, but he does worry that it is not the most profitable. Since he became president less than two years ago, Keener has been applying what he calls "a planned approach to profitability."

The company cannot do much about some of its problems, such as price competition for its chemicals and plastics division, or the rising costs of labor and natural rubber. But Keener has seen plenty of opportunities to put his "planned approach" to work. And while it is too early to judge the effect, the indexes are beginning to look up.

• **Opportunities**—To take advantage of higher profit margins abroad, Goodrich is expanding its international operations. New plants are open or will open soon in Brazil, the Netherlands, Iran, and Australia. In the past, Goodrich was content with a minority interest in joint ventures; now Keener prefers a majority interest.

New-product proposals are being screened more carefully; and Goodrich is dropping products that do not meet its profit standards. Last year, it sold one plant and simply shut down another. Of Goodrich's internal problems, organization is the most basic.

Keener believes in "cross-streaming," in moving men around in functions to give them broader experience, to keep the organization from becoming ingrown.

Keener himself is a product of "cross-streaming." A former professor of business administration, he joined Goodrich as a special analyst. He founded the company's business research department, which does its economic forecasting and market research; he held staff jobs in finance and employee relations before moving into general management.

• **Tighter Controls** — About six years ago, Goodrich switched to a divisionalized organization, with managers responsible for their own manufacturing, sales, and pricing. Keener thinks decentralization is still basically sound; he describes the current changes at Goodrich as a rationalization, a "rounding off" of decentralization, not a reversion to centralization.

J. Ward Keener

Headquarters staff is being built-up, both in numbers and authority. There is a new post of controller; a marketing vice president was hired from the outside.

The corporate staff has the job of tightening controls. They are going about it by comparing expenses, location by location, against set standards, and probing for ways to automate, to economize on quantity and quality of materials, and to share equipment among the divisions.

Headquarters is doing a lot more work in analyzing the divisions' requests for funds. Projects must meet profitability standards. Divisions must show that spending is necessary to boost sales, reduce costs, or protect a market. Until all the figures have been checked and evaluated, a proposal cannot even come up for consideration.

• **"Councils"** — Capital expenditures, major purchases, and salaries have all along had to be approved by headquarters groups officially called councils. Goodrich's councils meet and discuss, but the chairmen make the decisions.

A new research and development council is now working out priority lists for new products. Another council is watching divisional inventories of products and materials. Keener likes the written word, and he demands—and actu-

ally reads — voluminous reports from the council chairmen.

• **Market Research** — Goodrich knows its distributors well, its marketing men say, but the company is vague about just who buys from them, how much, and why. And about two-thirds of Goodrich's sales volume now comes from consumer goods. Keener, a proponent of "the marketing concept, total marketing, or whatever you call it," believes that "everything starts with the customer." Goodrich is working on this idea.

Products have traditionally been assigned to the divisions with the technical ability to produce them, rather than to those with the distribution channels to sell them. The industrial products company, for instance, makes—and markets —consumer items such as hot water bottles and baby pants. For competitive reasons, Goodrich will not talk about its specific marketing plans, but it seems likely there will be changes in marketing organization.

One important change has been made. It used to be optional to use the services of the market researchers, but now every new product proposal must be accompanied by a market research report.

The market research staff is working on standards to judge market potentials and distribution channels. It is also systematically screening industries for new product opportunities. Keener favors diversification that represents "a logical extension of our perimeter." (*Business Week, Nov 7, p169*)

Latin American Company Solves Currency Problem

Operating control was regained by isolating dealings in foreign currencies.

HOW DO YOU ADD apples and oranges? This ancient puzzler is brought forcefully up-to-date for companies with international operations: How do you add dollars and francs and come out with cruzeiros? The question is not academic; the wrong answer can wreck a management control system.

Take the problem faced by one Argentine company engaged in international commerce. This company receives almost all of its income in U. S. dollars and sterling; about 65% of its expenses are paid for in foreign currencies, 35% in Argentine pesos. Its accounting and control records are maintained in pesos, with each transaction converted at the going exchange rate.

As long as a normal balance existed between currencies, the company had no problem. But once the balance was upset—and it is continuously being upset with a soft currency like the peso involved—management began to lose control over costs and profits. It was not even sure of the firm's asset values.

• **Advice**—For a solution to its problem, the company sought the advice of a management consulting firm, in this case, the U.S.A.'s Barrington Associates. The consulting job was carried out by John W. Guinee, Jr., out of New York and Albert Calderaro, Barrington's consultant in Buenos Aires.

Management was aware that inflation had an affect on its operations. It could show, for instance, that the peso had decreased 53% in value over one 13-month period. Theoretically, assuming that operations remained at the same level, and that the 65-35 expense relationship held, sales in the 13th month should be 53% above the first month; expenses, 34% more; profits, 89% greater.

Trouble developed, the consultants reasoned, because business did not remain stable. Operations changed from month to month; sales were booked in one month, billed two months later, paid for in the fourth month. Thus it was impossible—or misleading—for the company to compare operating results with past performance or with budgeted figures.

• **Answer** — The solution that Barrington came up with is quite simple, but effective; and it is applicable to any kind of business dealing with various currencies of fluctuating value.

Every transaction involving foreign currency, Guinee concluded, should be considered as two transactions: (1) The sale or purchase of goods or services; and (2) the sale or purchase of Argentine pesos. The consultants' experience led them to a parallel—the technique used in standard cost systems to make adjustments for changes in material costs. This would mean recording all operating transactions at a standard rate of exchange, with the difference in currency value going into a special account. Currency fluctuations would thus be isolated.

• **Testing**—Standard exchange rates were developed by studying the historical relationship between the currencies, and current values.

To test the system, Barrington decided to reconstruct the company's books for a complete year. This meant that every ledger posting had to be converted back into its original currency, then reconverted at the standard rate. Then they drew off a new set of operating statements. Compared to the unadjusted statements, the overall difference was not too drastic: Sales were overstated 13%, profits, 12%.

But for individual projects, some crucial differences were noted. For example: During the course of one project, the peso's value had plummeted; as a result sales had been overstated by 26%, direct profits by 60%. And the consultants found similar variations when they ran analyses of sales territories, product margins, inventory value, rate of return on investment.

• **Results** — Management agreed that the new accounting method would be worthwhile. Standard exchange rates were put into effect (they can be changed periodically), along with an account, "Loss and Gain from Currency Transactions."

Now the company has a working management control system. Management's attention has already been focused on areas where revenues and expenses are out of line. And the most important profit areas have been identified. As an unexpected benefit, management believes it can increase profits from its currency trading. ●

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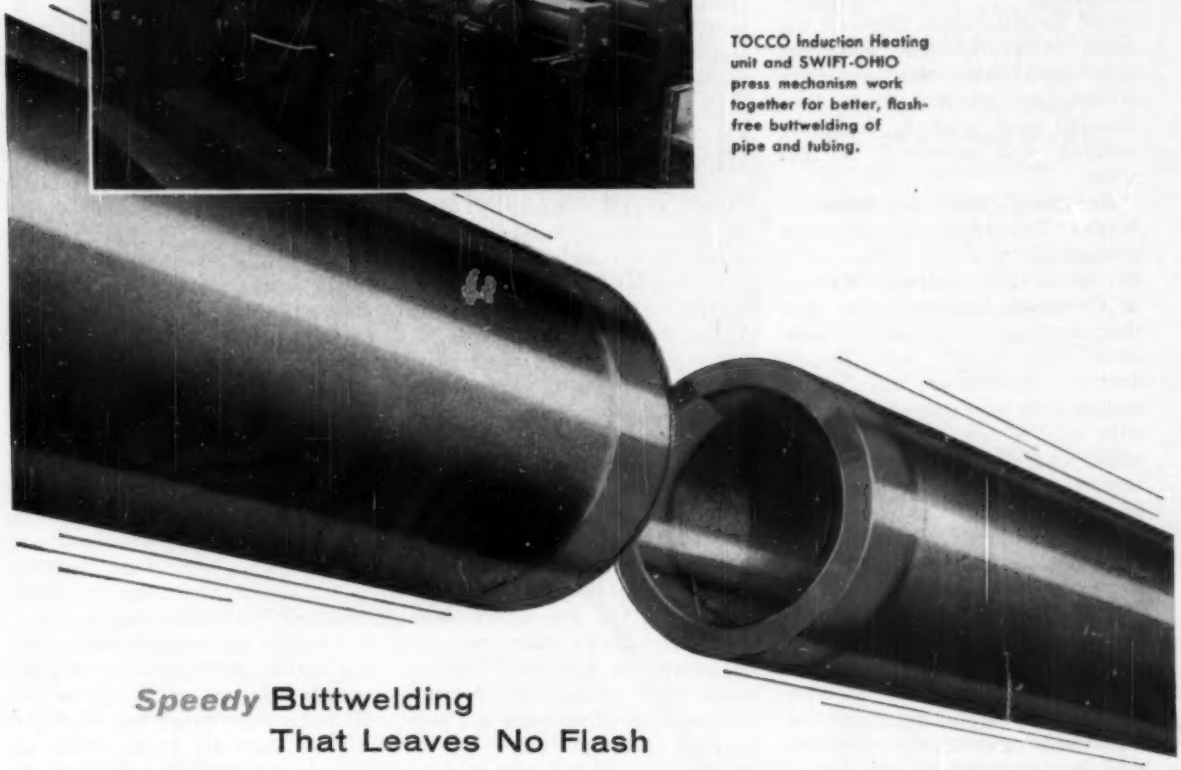

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Two New Studies Shed Light On . . .

1. Management Goals

Are hired managers less profit-minded than owner-managers? After interviewing managers in 145 companies, a U.S. researcher found no differences between the goals of professional managers and those of owner-managers. Both groups put profits first, then stressed good products, employee welfare, and growth — in that order.

However, James K. Kent, of Wayne University, did find that management goals are influenced by the nature of the company. Writing in *Personnel Psychology*, he says that managers of companies with mostly "blue-collar" (bench or production) workers are more profit-minded than managers of companies with a lot of white-collar (professional and clerical) workers. Executives of white-collar companies are more likely to emphasize growth, possibly in response to the employees' desire for promotion.

2. Worker Attitudes

After studying 300 workers in two departments of the same plant, Professor Chris Argyris of Yale University concluded that unskilled workers doing primarily repetitive work are interested mostly in their pay. In contrast skilled workers value job variety, and being left alone to do their jobs in their own way, more than they value pay.

Surprisingly, both kinds of workers were happy with the same type of foreman. In this plant, the foremen made virtually no decisions; and they did not seem to have any "human relations skills" such as sensitivity to feelings and listening ability, reports Argyris in the *Administrative Science Quarterly*.

Foremen won the respect of workers by providing the kind of direction the workers asked for: They absorbed pressure from above, so workers did not feel under tension; they kept up a steady stream of piece work; and they allowed the workers to do their jobs in their own way.

In other words, their main contribution was acting as a sort of buffer to higher mangement. ●

In Management

FIRST OVERSEAS CENTER of the International Management Association, a division of the giant American Management Assn., will be established sometime this year in Sao Paulo, Brazil. It will be a self-sufficient management center staffed by Brazilians, sponsoring training sessions, seminars, clinics on current problems, and other activities. The likeliest site for the next IMA operation overseas: In "common-market" Europe.

JOINT VENTURE TROUBLES: After a conflict over policy, Sears, Roebuck & Co., the international department store chain, has sold its interest in Australia's Walton-Sears, Ltd., which now becomes Walton, Ltd. It provides a classic example of the problems that can plague international joint ventures (IMD—Oct.): Walton directors wanted dividend payments now; Sears wanted to plow back profits. Sears wanted to build new stores; Walton wanted to buy existing properties. Walton Ltd. now has two department stores, 47 appliance stores, a mail-order plant.

TECHNICAL AID for underdeveloped countries is the goal of Switzerland's new Foundation for Technical Development Aid. Financed by private Swiss firms, the Foundation will have headquarters in Zurich. In first stage, instructors will be sent out to teach classes in carburetor engines, electric motors and engines, and building crafts. Some students will alternate classes with on-the-job training; the brightest students will be sent to Swiss technical schools, where they will train to become instructors.

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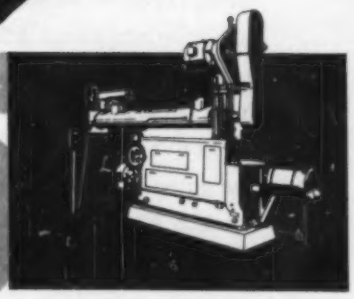

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Recommended Reading

Handbook to Higher Learning

The International Handbook of Universities, edited by H. M. Keyes, provides classified information on nearly 450 institutions in 70 nations, and briefly mentions over 1,000 others. $6.00. (The International Association of Universities, 2 Place de Fontenoy, Paris 7e, France.)

Planning the Office

Office Building and Office Layout Planning, by Kenneth H. Ripnen, will serve as a practical guide in the planning, setting up, and administration of office space for efficient and economical operation. It tells how to make maximum use of space, lighting, partitions, color. 200 pages, $10.00. (McGraw-Hill Book Co., 330 West 42nd Street, New York 36, N. Y., U.S.A.)

The Marketing Audit

Analyzing and Improving Marketing Performance tells how leading U.S. firms are using the "marketing audit" technique to analyze marketing functions realistically and improve performance. Methods of appraising a company's markets, products, competition and sales force are described. $3.75. (American Management Assn., 1515 Broadway, New York 36, N. Y., U.S.A.)

The U.S. Economy in the '60s

New Forces In American Business, written by Dexter M. Keezer, director of McGraw-Hill's Economics Dept. and his associates, analyzes the strengths and weaknesses of U.S. economy in the next decade. Their prediction: reasonable stability and growth, thanks to the dynamism of new plant and equipment spending, larger research programs in industry, increasing population, skillful marketing. 278 pages, $4.75. (McGraw-Hill Book Co., 330 West 42nd Street, New York 36, N. Y., U.S.A.)

Bulletins from Industry

Oakite Products—manufacturers of cleaning and sanitizing compounds for industry—is offering a booklet entitled. Industrial Floors: How to Clean and Care for Them. (Oakite Products Inc., 19 Rector Street, New York 6, N. Y., U.S.A.) . . . Bulletin 69 shows how Standard conveyor installations can lower materials handling costs. (Standard Conveyor Co., North St. Paul, Minn., U.S.A.) . . . Visible Control for Machine Systems explains how visible record-keeping systems provide help in making sound management decisions, and assist office machines by increasing their operating efficiency. (Remington Rand Intl., 315 Fourth Ave., New York 10, N. Y., U.S.A.)

All About Computers

The second volume of the Handbook of Automation has just been published. Computation and Control, written by E. M. Grabbe, S. Ramo, and D. E. Wooldridge, provides practical material on the design and use of digital and analog computers, functions of data-processing systems as well as techniques, equipment, and applications, and an entire section on programming and computing. 1093 pages, $17.50. (John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y., U.S.A.)

INTERNATIONAL
MANAGEMENT'S

Personal Business

Imperfect Sight—Some Facts and Fallacies

Faulty eyesight is common among business executives today, and can hamper both work and play if not properly treated. There are widespread misconceptions about imperfect sight and what you can do about it, according to Business Week.

Basically, vision is a brain function. People interpret images in the light of experience. But standards of "normal" eyesight—such as "20/20" —are a mechanical concept. This one refers to the ability to read a certain size test letter on an eye chart 20 feet away. Thus, a person with 20/20 can see what experience says he should be able to see at that distance.

A 20/40 record would mean he could see at 20 ft. a letter that should, by normal standards, be readable at 40 ft. You need at least 20/40 in your better eye to see average book print without strain.

Refractive errors—nearsightedness (myopia), farsightedness (hyperopia), and poor near-and-far focus (astigmatism)—**are caused by abnormal eye shape and occur at any age.** But presbyopia hits all persons over 40.

Presbyopia means, briefly, that the eye lens has lost its elasticity and thus its ability to bring close objects into sharp focus. If you are over 40 you have it, and you'll have it more and more as the years go by.

Glasses, of course, are the usual answer to these refractive problems. "Eye exercises" to restore eyesight without glasses may appeal to vanity but not to common sense, according to some leading specialists.

However, there is one new optometric technique called "visual training" where eye exercises can often be effective. Here the aim is not to restore eyesight but to make the best of whatever eyesight the patient has. The exercises are based on the concept that vision is an acquired skill. Children with reading problems often benefit tremendously from them.

Misconceptions about eyesight are legion. Here are a few clarifications:

—Contact lenses can safely be worn by active sportsmen.

—Glasses cannot cure an optical defect, like myopia, no matter how long you wear them—they merely compensate. Old, unsuitable lenses will not "ruin the eyes" either, though they may cause discomfort. The same is true of wearing no glasses at all.

—Tinted glasses are over-rated—the eye is well adapted by nature to filter out harmful ultraviolet and infrared rays. Wear them only in excessive glare. "Cheap" sunglasses, by the way, do little or no harm.

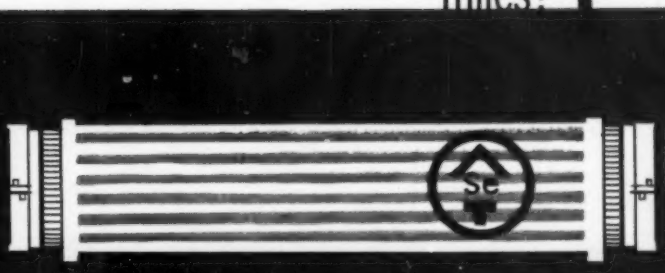
—Old age does not bring an improvement in vision—except in some cases where a person stops doing close work or reading.

1959—Great for Grapes, Poor for Pearls

After some of the worst years in French wine history ('56 and '57), 1959 may go down as the golden year of the century. First pressings showed the grapes to have a potential 14% alcohol content (1% to 2½% higher than normal), low acidity, and enough tannin to give the wine full color and long life. It will probably be about two years before the "great '59s" reach world markets—and then at higher prices. . . . You can expect cultured pearls from Japan to cost more in 1960. Storms have ruined the crop; Japan has reduced its shipments and prices are moving up fast.

How does sixteen feet **equal** two miles?

16' x SIX·EIGHT·FIVE = 2 MILES



A cooling area of 3500 square feet and a weight of eight tons make the new giant KARBATE Brand Impervious Graphite Series 6850 Shell and Tube Heat Exchangers from UNION CARBIDE the largest in the world. Packed within the 45 inch shells of these KARBATE Heat Exchangers are 685 sixteen foot tubes which, laid end to end, would measure out to over 2 miles of tubing. While these figures are impressive, you will find the unit's increased capacity and efficiency are even more so.

These KARBATE Heat Exchangers are in use as sulfur dioxide gas coolers in a process producing sulfuric acid from the petroleum industry's refinery sludge acid. The big exchangers operate in much the same manner as a dehumidifier or air conditioner. Moisture laden corrosive gases flow through the tubes of the vertically mounted units. Water passing through the unit's shell cools the gas and condenses out the unwanted moisture. The end result is a cooled, semi de-moisturized gas ready for further processing into a valuable product. And this is just one of the many uses of KARBATE Heat Exchangers in industry.

This realiable KARBATE Heat Exchanger series is available in lengths ranging from six to sixteen feet. This new series of KARBATE Heat Exchangers is nearly double the size of other models and gives five times more cooling area. And these gas coolers of KARBATE Impervious Graphite are more economical and last longer than coolers made of less corrosion resistant materials.

FREE, write for booklet IMD-1A and learn more about how you can profit from KARBATE Impervious Graphite Units which provide the required heat exchange with less than ⅔ the area required by carbon steel units. Write to **UNION CARBIDE INTERNATIONAL COMPANY,** Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y., U.S.A., Cable Address: UNICARBIDE, New York.

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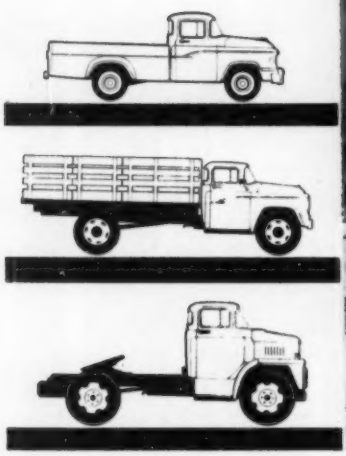

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